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THE SURGERY OF ANTERIOR POLIOMYELITIS.[1]

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In a symposium embracing the consideration of only the acute stages of anterior poliomyelitis, there would appear to be no place for the consideration of the surgical aspect. The great advances that have been made in the surgery of infantile paralysis have dealt with the resulting deformities and loss of function, but have had no place in the prevention or amelioration of the affection. Most writers on the subject of surgery in infantile paralysis urge deferring operative procedures until at least one year has elapsed from the time of onset. This intervening period is, however, the most important time in the whole history of the affection. It is during this period that prophylaxis can play such an important rôle in the prevention of the ensuing deformities of contracture, of dislocation, of atrophy from disuse, etc. It is therefore important that in the beginning the surgical aspect should be kept in view in intimate connection with the distinctly medical side of the subject.

The various conditions following anterior poliomyelitis that have been benefited by modern surgical procedure are tendon contractures, relaxation of ligaments, flail joints, dislocations, changes in the shapes of bones, deformities due to incoördination of muscles, and atrophies of muscles from excessive use as well as from disuse.

Prophylaxis must occupy an important position in preventing the occurrence of many of the above conditions, or at least in preventing their severest manifestations.

In many patients, years after the onset, it is impossible to determine whether muscles are atrophied from disuse or were originally affected by the paralysis, and a brief consideration of the mechanism will usually explain this apparently difficult problem. Assuming for the sake of illustration that the triceps muscle is the seat of the original paralysis and being therefore inactive, leaves its opponent, the biceps humerus, without active restraint. The function of the elbow becomes more and more impaired, inasmuch as the only active muscle controlling it, the biceps, is not resisted, and there very soon follows a gradually increasing atrophy from disuse, affecting the said biceps muscle. The elbow becomes a flail joint, and without a careful microscopic examination of the constituent parts of the two muscles, namely, the biceps and triceps, there appears to be no way of determining which was originally lost by paralysis and which was lost by disuse. The ultimate effect is the same in both cases. In the early history of the affection in an individual case, in which the above conditions were present, care and attention would be given to prevent the occurrence of the atrophy from disuse by recourse to remedial measures peculiarly adapted to the requirements of the case. Thus prophylaxis plays a very large part in the prevention of the serious forms of deformities that frequently occur.

[1] Read before the Lehigh Valley Medical Association, January, 1910.

Similar conditions can be used to explain the occurrence of subsequent contractures. Contractures invariably take place with the joints flexed because all joints are in a condition of greater or less degree of flexion the greater part of the time. They occupy a position of full extension for a very brief period, whether the patient is active, as for instance in the daytime, or lying relaxed in sleep. So great is this contracture at times that not infrequently dislocations, either complete or incomplete, are frequent subsequent results. At the beginning the contractures are of a very trivial character, and depend entirely upon the position of the affected joint when not in use.

What has been stated above with reference to the elbow-joint applies equally as well to all other joints. Contractures of the hip are invariably contractures of the tensor vaginæ femoris, the sartorius, or anterior muscles. Contractures of the knee are invariably those of the hamstring tendons, and never those of the anterior groups of muscles. It will be apparent therefore that prophylaxis has a very large field during the first few months of the first year after the onset of the affection of anterior poliomyelitis.

The various investigating committees have reported that about fifty per cent of cases of anterior poliomyelitis have more or less severe pain, sometimes excruciating. Meningitis is emphasized as a feature of the morbid process, and by inference it might be considered the sole cause of pain.

T. A. Williams[1] concisely states that there are two distinct kinds of pain resulting from poliomyelitis. The first is due to meningitis and not within the scope of this paper. The second is due to mechanical and secondarily nutritional effects following destruction or interference with the neurons governing the muscles. It closely resembles the pain resulting in healthy patients from prolonged cramped position or overexertion, and is caused by the sagging of joints and inactive muscles. In proof of this it is only necessary to refer to the relief from pain that is afforded by efficient methods of rest and freedom from the weight of the suspended limb.

F. Lange[2] emphasizes the great importance of the proper application of a plaster-of-Paris bed or jacket which gives support to the entire body. This method was first suggested by Oppenheim, and since has been extensively employed.

Lange and others believe that experience with acute inflammations indicates that entire and complete rest of the affected parts is the most important requirement. Such methods frequently cause the pains to subside. They prevent the excessive use of the paralyzed muscles. They prevent the affected limb from sagging at the joints.

It is possible that the paralyzed muscles will recover under favorable circumstances, thereby greatly diminishing the ultimate disability.

A patient efficiently supported by a properly constructed plaster-of-Paris cast cannot so conveniently be subjected to the unnecessarily severe form of deep massage, but can receive the superficial light friction that is more appropriate.

The soft and tender muscles of a child are rendered more susceptible to injury when they are paralyzed, and therefore most careful and delicate handling should be the rule. Deep, forcible massage of the kind most frequently applied is injurious and should not be permitted.

Electricity in some of its best forms will aid in stimulating muscles, and conversely, overstimulation must be injurious.

The prevention of contractions often necessitates mechanical apparatus, but the greatest care is demanded to avoid injury in the attempt to benefit the patient.

Experience has demonstrated that normal muscles are injured by the pressure of orthopedic apparatus, and the injury in paralyzed muscles is often unjustifiable. Rigid braces that aim at correction of contracture or deformity should be limited in length of time of application as well as in the weight. Very frequently it is desirable to confine the use of mechanical apparatus to the sleeping hours to avoid the strain of carrying additional weights.

As a rule, deformities of the arm are less corrigible than the subsequent deformities that occur in the leg, the explanation of which can be readily found in the greater ability to dispense with the use of an arm, substituting therefore excessive use of the other arm. In the leg more or less functional use is made, stimulating therefore the muscles to use, and thereby tending to avoid the atrophies from disuse, as well as tending to avoid the contractures that often follow.

Extreme care should always be employed in the use of any form of a brace or stiffening appliance to avoid disuse, and as well to avoid throwing excessive function upon any weakened muscular structure. Apparatus, therefore, should have for its object the development of muscles with the least possible hindrance, to encourage weight-bearing and the function connected therewith.

Until a very recent period the surgical consideration of infantile paralysis was very largely, if not entirely, confined to subcutaneous tenotomies of contracted muscles in order to obtain fuller extension, thus facilitating weight-bearing by means of mechanical supports. While a great deal was accomplished in facilitating locomotion, the division of shortened muscles was rarely ever followed by restored function of the affected parts. The inactivity of the circulation in infantile paralysis rarely tended to produce good, strong bond of union of the divided tendons, and flail joints many times resulted that required great mechanical ingenuity in the construction of appliances to give them stability.

There then followed a long period of time in which great attention was given by operators all over the world to overcome the contractures without the loss of repair that has already been referred to. Most ingenious operative methods have been devised in the form of tendon splicing so as to secure perfect contact of at least a part of the divided tendon that required elongation. Here, again, the primary object was to obtain lengthening of the tendon to permit extension of the affected parts, thereby facilitating ambulatory apparatus.

One of the first methods of elongating other than by simple division was suggested by Dr. J. Neely Rhoads, of Philadelphia. It is done subcutaneously, and a knife for the purpose was devised by Dr. O. H. Allis, of Philadelphia. This knife has a long shank and a short blade with a curved cutting edge. The method of procedure is as follows: After puncturing the skin above the upper point of division, introduce the knife-blade flatly between the skin and the tendon, turn it, and cut through the middle of the tendon, longitudinally, for the required distance, then cut out at one side and withdraw the knife. Introduce it at the lower end of the longitudinal incision and cut off the opposite half of the tendon. Elongation can thus be accomplished and the ends be allowed to overlap for tendinous union. No sutures are employed, as the entire procedure is subcutaneous. Dr. Rhoads also suggested the use of this method in lengthening nerves and bones. Where but a small amount of lengthening is desired, he suggested[3] cutting half through the tendon at different levels and from opposite sides, leaving some longitudinal fibers to slip on each other, thus gaining slight elongation.

Where lengthening of the tendon is desired, and splicing and tenotomy are inadvisable, Dr. F. Lange[4] suggests cutting the tendinous portion in the fleshy part of the muscle. The muscular fibers are easily stretched the desired length, and there is no risk of non-union of the tendon.

Mr. Anderson,[5] of London, on October 18, 1889, devised and practiced a method of tendon elongation, which, though the tendon is incised similarly, differs from and excels Dr. Rhoads's method in being done openly and with sutures through the severed ends. It also obtains a positive and definite increase in length, and perfect apposition of the severed ends.

Dr. W. W. Keen, of Philadelphia, performed independently the same operation on November 29, 1890 (thirteen months after Mr. Anderson), and published it (four and a half months before Mr. Anderson's paper appeared) as an original method of obtaining positive and definite lengthen-

ing of a tendon; but upon learning of Mr. Anderson's priority in performing it, he resigned all claims of originality in favor of the former.[6]

After the publication of this method of elongation I suggested its use in shortening a tendon, and I have performed it with marked success, the first occasion being on June 10, 1891.[7] The incisions are made in the same manner, sufficient tendon is removed to obtain the desired shortening, then a corresponding amount is removed for symmetry, and the ends are stitched.

Another method which has been adapted to lengthening or shortening is that of Mr. Willetts,[8] of London. After the tendon has been exposed, it is cut diagonally from without inward and from below upward, the ends are allowed to slip past each other for the required distance, and are there held by two sutures on each side; if for shortening, the necessary amount is removed from one end and the oblique surfaces are brought together.

Of the methods of suturing divided tendons, that of Esmarch[9] is the simplest. It consists in overlapping the ends and holding them by means of a suture passed through and through. Another is end-to-end anastomosis, as done by LeFort,[10] in which a suture is passed into the side of one end, out in front, into the front again, and out at the other side; then each end of the suture is passed into the corresponding side of the opposite end and out in front and there tied. This secures the tendon ends in the desired position, and prevents separation by muscular contraction, which frequently follows tenotomy.

Wolfler's method[11] differs from the above in the sutures being passed in and out several times, partially encircling each end of the tendon, and in its being tied at the side. The same end is accomplished as above, but the method illustrates the ingenuity of surgeons in attempting to obtain the same results.

Another method is that of LeDentu.[12] One suture, passed through each end, is tied at the side, and two supplementary sutures, one on each side of tendon, are introduced nearer the ends and at right angles to the first suture. These three methods, all very much alike, were originated about the same time by three different men, each ignorant of the other's plans.

About a year and a half after these were published, Dr. Trnka[13] recorded a method which had been devised by him in 1887. It differs from those mentioned in the manner of inserting the suture. It is passed transversely through the anterior half of one end of the tendon and back through the posterior half, then in the same manner through the other end, loops being left on that side on which the suture is passed directly back through the tendon. The free ends of the suture are tied, and the loops are connected by a separate suture, and when drawn taut equal tension is made on each side of the tendon. A similar method of joining the loops does away with the extra suture. After the suture is passed through the one end, a long loop being left, it is passed through one side of the other end, through the first loop, and then back through the other side and tied. This method secures firm apposition of the ends and aids very much in obtaining strong union. A method of lengthening has also been devised by him in which the upper end of the tendon is split from within three-eighths of an inch of the end upward the required distance, then cut out to one side, and this half turned downward to be joined to the lower end. In the same manner as the suture was introduced in the other, a suture is passed through the end which was split, the half turned downward being included in the loop, then through the other end, including the connecting half, and then tied. The half which was split out and turned over acts as the extra suture.

Some time ago I devised (and performed for the first time in September, 1893) a method which has the advantage over Trnka's of there being more tendinous tissue between the two severed ends, and consequently a stronger tendon after union. It is done by splitting both parts of the tendon equally for the required distance from within three-quarters of an inch of the end and cutting out to one side at the other end of the incision and at opposite sides of the

tendon. Now turn over these cut halves and pass a suture through each one, and tie each separately.

Czerny[14] provided for strength by utilizing part of the tendon for the lengthening process, transplanting the end of the part cut from the side of one tendon into the other free end, so that tendinous structure is secured through the entire course. This method can be illustrated by placing one finger of one hand between two fingers of the other, the exact relation of the two tendon ends. They are held in place by through-and-through suturing.

Schwartz[15] devised a method of anastomosis where juncture of the two ends, for some reason, cannot be effected. He divides a neighboring tendon longitudinally, as in the extensors of the fingers, and cuts off one-half at the distal end of the incision, then attaches the distal end of the severed tendon to this freed end of the half of the neighboring tendon, thus securing the movement of the two parts or members by means of the one muscular action.

The Tillaux and Duplay method[16] is a very ingenious one, accomplishing the same purpose as that of Schwartz. A longitudinal incision is made through a contiguous tendon, and the distal end of the severed tendon inserted in it and sutured in position. Two members may thus be operated by one muscle, or two muscles, if the proximal end be inserted, may operate one member.

These operations represent the principal ones for tendon splicing, lengthening, or shortening by division of the tendon in its entirety. Several complicated methods have been devised for the purpose of utilizing tendinous tissue in lengthening and yet not entirely dividing the tendon at any point. The originator of either plan is unknown to me. The first one is the more complicated of the two which I shall mention, and is done as follows: Divide the breadth of the tendon into fifths. From each side and at the same level cut transversely through two-fifths to the middle fifth, then longitudinally for the required distance. Then enter the knife at a point one-half inch below the transverse cut on one side, and in the line separating the first and second fifths cut longitudinally a distance equal to the first longitudinal incision, turn the knife and sever the middle three-fifths, turn it again and cut upward for the same distance as the parallel incisions. The last incision will embrace the first two between the longitudinal cuts. The amount of elongation is graduated by the length of the longitudinal incisions. The disadvantages of the method are that the tendon must be a very broad one, and that a great degree of skill on the part of the operator is required to perform it, even in a large structure.

The other method is adapted to the same purpose, but is less complicated than the one just explained. The breadth of the tendon is divided into thirds, and longitudinal incisions of equal lengths, but at different levels, the right being the higher, are made between them. Then cut transversely through the left two-thirds to the upper end of the right longitudinal incision, and through the right two-thirds to the lower end of the left longitudinal incision. Draw on the tendon: it is elongated, and is composed of tendinous structure through the entire length. In both these methods reënforcement by sutures of that part of the tendon where the ends remain intact would be necessary. Both show considerable ingenuity on the part of the originator, yet lack that simplicity which is necessary for practical application.

The most decided advances in the surgery of infantile paralysis have been in the line of transplantation of tendons, and it has been found that strong active muscles can be made to change their function so as to perform the function of reverse muscles in their new relationships. While the method of tendon transplantation has accomplished a great deal, it has at times been carried to an extreme because of the absence of available material in a given case. Where a powerful muscle like the gastrocnemius is lost, it is extremely difficult to find any substitute for it without materially altering the mechanical action of the foot, and the attempt to transplant any of the muscles of the leg so as to perform the function of the gastrocnemius will re-

sult in such tremendous strain upon this transplanted muscle as to produce atrophies from excessive use which very closely resemble atrophies from disuse.

In the earlier attempts at tendon transplantation, the tendon of an active muscle was transplanted into the tendon of an inactive muscle with a desire to transfer the function of the active muscle into the inactive muscle. The resulting conditions were far from satisfactory, because of the lack of vitality and the tendency to stretch of the tendon of the disused or paralyzed muscle. Very many failures occurred, notwithstanding the most carefully elaborated technique and very proper selection of material for transplantation.

Most writers give the credit of originating tendon transplantation to Nicoladoni, and state that in 1882 he attached the peronei to the tendo Achillis in a case of paralytic calcaneus. Arthur W. Elting,[17] in an extensive historic review of tendon transplantation, states that Duplay[18] in 1876 transplanted tendons in a case of loss of function of the arm due to traumatism.

In 1892 Parrish,[19] of New York, reported a case of clubfoot treated by this method and was the first one in America to transplant tendons. The same year Drobnik[20] used the same procedure and proposed periosteal insertion of transplanted tendons.

In 1894 Winkelman grafted a strip of the tendo Achillis upon the peronei, and he was the first to publish and analyze a series of cases, sixteen in all.

Since 1894 Goldthwait, of Boston, and other orthopedic surgeons, have perfected the methods and elaborated the details of the after-treatment. So little had been written on the subject prior to 1896 that Goldthwait's[21] study was believed by him to have been on original lines.

Careful research into the literature revealed the priority of Nicoladoni's operation, but he was, apparently, not aware of the operation done by Duplay six years before Nicoladoni reported his case.

F. S. Eve[22] in 1898 reported 274 of these operations, and Vulpius[23] in 1899 gave his experience in 160 cases. Lange[24] in 1902 introduced artificial tendons of silk between the sound and the paralyzed tendon, following the example of Gluck,[25] who in 1892 had used bundles of silkworm-gut to bridge over the gap after division of tendons in injuries.

Kummell[26] in 1896 had found that strands of silkworm-gut subsequently became converted into fibrous tissue.

The method of transplantation of tendons is applicable to those cases in which function is faulty because of ill-directed voluntary movements, and it aims to restore the balance of power as far as possible. It is applicable in traumatic loss of function of muscles and tendons, spastic paraplegia, infantile paralysis, and congenital deformities. I have obtained results from tendon transplantation in flatfoot that were never considered possible in aggravated cases.[27]

Prof. Dr. E. Muller[28] employed the method of tendon transplantation and arthrodesis in paralytic valgus. The distal insertion of the extensor proprius hallucis was cut and carried through a vertical hole which had previously been drilled through the scaphoid, and the end of the tendon was sutured to the under surface of the scaphoid. The arthrodesis was performed on the astragalo-scaphoid articulation.

It is evident that the affected joint cannot be restored to full normal function when there is definite loss of muscle force by paralysis. The removal of deformity and ill-balanced muscle function and securing proper relative balance of voluntary action tend greatly to improvement in the general action and function of the parts involved.

Very often muscles that were previously deemed absolutely lost, in which the electromuscular evidence of degeneration was perceptible, subsequently demonstrated the resumption of function. One of the greatest benefits that may be obtained is the freedom from further necessity to use braces or forms of mechanical support.

There are anatomic and surgical limitations to the transplantation of tendons, but many of these limitations have been overcome, at least in part, and now it seems perfectly possible to reverse absolutely the

normal action of muscles advantageously. Thus, flexor muscles become extensors; pronators become supinators.

It requires care to regulate and adjust to a nicety the amount of power to be transferred. Often previously undeveloped muscles become revivified, and their functions, added to the transferred function, carry a preponderance of power; thus the balance is again disturbed, but in the opposite direction from that formerly existing.

The best results have, I believe, been obtained in cases of anterior poliomyelitis in which at least one year has elapsed since the onset. This period is usually sufficient to have demonstrated the muscles that are lost or impaired as well as those that are fully capable. Those muscles possessing full function sometimes become exaggerated in their action, because they lack the resistance afforded by their opponent groups, and there follow the disturbed balance of power, the faulty postures of the extremities, for which relief is sought.

The question has many times arisen as to the effect upon the motor centers of the brain by the alteration of function of muscles produced by tendon transplantation. A person desiring a certain mechanical movement obtains that motion in normal conditions in a definite manner. The brain sends out an impulse to the muscles involved, and the resulting action depends upon the origin and insertion of the muscles. The action in normal conditions depends also upon the correlation of the muscular forces, the resisting groups counteracting the acting muscles, and thus the proper balance of power is exerted.

In the abnormalities of infantile paralysis there is more or less disturbance of the relation between the various groups of muscles, and this disturbance increases with the further degeneration of the paralyzed muscles and the atrophy from disuse of the others, while the unaffected groups assume undue proportions, because of the absence of normal resistance.

In infantile paralysis patients soon acquire an intuitive method of brain control by limiting the force to the exigencies and an adaptation to the demands of the parts involved. As a matter of experience the effect of the brain on the transplanted muscles or the effect on the brain may be laid aside, because, surgically, the object sought is to transfer the insertion of a muscle to a suitable point for correct balance of power, and this is accomplished without evidence of having disturbed the brain. Tubby and Jones[29] in their monograph observe: "Are we to regard nerve impulses as of specific nature—that is, extension impulses or flexor impulses; or are we to regard them merely as being forms of force sent down to a muscle, and the direction of the force produced as being in no way special to the nature of the nerve impulse? We incline to the latter alternative, and we take it that what happens in the brain in these cases is not any subtle change from flexor impulse to an extensor nerve impulse, after transplanting a flexor and making an extensor of it, but a change of perception on the part of the sensory centers, so far as the position of the limb is concerned; that is, the patient must learn that when a certain muscle is contracted, the limb is not in a state of flexion as heretofore, but in one of extension or supination instead of pronation."

Each case presents individual characteristics and must be studied with care to determine first the condition of the various muscles normally in control of the parts involved. It is necessary to predetermine a definite procedure, and therefore full information must be obtained as a preliminary measure.

All contractures of fascia, tendons, and any other structures must be removed and sufficient time allowed for the further development of the muscles that may have been influenced by the existence of these contractures.

It is generally desirable to select the reënforcing tendons from muscles whose normal action corresponds as nearly as possible with those to be reënforced. It is practicable, however, to take more or less remote tendons, remote in situation as well as remote in action. Not infrequently the conditions present leave no choice in the selection, and yet the resulting improve-

ment is often gratifying to the patient and to the surgeon.

It is always important to keep well in view the thoroughly established fact that muscles that previously gave evidence of paralysis have exhibited signs of returning strength after transplantation. This has also been observed many times after the removal of contractures about a joint, and indicates the necessity of knowledge on this point in avoiding overcorrection. Hoffa has many times seen muscles that were decidedly yellow at the time of operation, and were therefore inactive from apparent degeneration, subsequently assume almost full normal function after rearranging the insertion.

The operation of tendon transplantation is rarely applicable to cases in which all of the muscles about a part are paralyzed. There being no active muscles, very little if anything is to be gained by transference of tendons, but rather the method will be brought into unjust disrepute by the failures that should have been avoided. The reënforcing tendon should be taken to the paralyzed tendon or to the periosteal insertion in the most direct manner possible, so that its full force may be obtained without the loss of rounding corners.

In selecting an opponent of a muscle that is paralyzed, it is important to remember that the reënforced muscle is not only gaining power from the opponent, but it is losing its resistance from the normal antagonism.

The parts affected by the transplantation should be so placed at the time of suturing the tendon in its new position that tension shall not be present during repair, but upon the restoration to normal posture of usefulness such tension on the tendon shall result that will approach that normally existing. A properly relaxed tendon at the time of the operation will be efficient or inefficient in proportion to the presence or absence of proper tension when the extremity is in proper position for function.

The treatment after operation is of importance equal to that of the operation. The affected parts must be held in plaster of Paris for a month or more in such position as may be necessary to secure proper union of the tendon without tension thereon. When the rigid appliance is removed, the patient should be carefully trained in the voluntary use of the parts without weight-bearing. This can often be supplemented by having the patient use the corresponding extremity, acting in unison with the one operated on.

As the transplanted muscle gradually assumes voluntary motion and as proper control over the affected parts improves, increasing latitude of function may be permitted and encouraged until in the judgment of the surgeon full function may be allowed. It is not desirable to resort to braces of any kind during the stage of development, because their use will more or less alter the action of the muscles and thereby modify the remedial physical culture procedures.

Many of the earlier failures were due in part to overenthusiasm as to the curability by recourse to transplantation alone, and now these failures are often avoided by associating arthrodesis as a supplemental measure. Arthrodesis, when properly used, aids very materially in preventing undue strain upon incapable muscles, and by preventing this strain enables the muscles properly to exert their full force in producing the necessary balance of power to the extremity involved.

Arthrodesis is the term that is used to indicate the intentional production of ankylosis of one or more non-pathological joints to overcome or correct deformity. It is generally accomplished by cutting out the articular surfaces of one or both of the bones composing a joint, or by removing a wedge of bone.

The accepted methods of inserting transplanted tendons are conveniently grouped under four headings: (1) Dividing a tendon of a healthy muscle and suturing its central portion to a paralyzed tendon. (2) Dividing the tendon of a paralyzed muscle and attaching its peripheral portion to a healthy tendon is called ascending transplantation by Vulpius,[30] and by Hoffa[31] the passive method. (3) Splitting the tendon of a healthy muscle and transplanting only a

part into the tendon of a paralyzed muscle. Vulpius calls this the descending method, and Hoffa calls it the active method. In suturing tendons together the quilt suture of Goldthwait has many advantages. (4) Attaching the tendons of transplanted active muscles directly to the periosteum was proposed by Drobnik and advocated by Lange. The last method is greatly to be preferred when possible, as the resulting bond of union secured by this means is much stronger and more durable. When the tendon to be transplanted is too short for periosteal attachment Lange's method after Gluck of using strands of silk to elongate the tendon may be advantageously employed.

It is self-evident that critical asepsis and not antisepsis is demanded in tendon surgery. The skin incision advocated by Vulpius is a very long one to facilitate inspection of the muscles and form an estimate of their degeneration. Eve advises against unnecessarily long incisions in the skin because of the interference with the venous circulation and subsequent edema. My own experience is that the skin incision should only be long enough to enable the surgeon to transplant the tendons successfully. In case arthrodesis is to be done, or when one incision is not sufficient, I prefer making several rather than to attempt to accomplish everything through one opening.

Tendon transplantation, alone or combined with arthrodesis or other bone operations, offers prospects of materially adding to the comfort, convenience, and usefulness of a very large class of patients otherwise more or less dependent upon forms of mechanical apparatus.

The frequently observed improvement in the action of muscles that previous to operation gave evidence of being paralyzed or atrophied from disuse shows the capabilities of restoration when the offending abnormalities have been removed. It is impossible to estimate properly what the future development in a given case will be. The coöperative, intelligent care of the patient must be depended upon in securing the best permanent results.

Muscles cannot develop when they are used to excess or are under constant strain. The atrophy from disuse, whether caused by tension or relaxation, often presents all of the appearances of paralysis.

The avoidance of overstrain upon incapable muscles is often demanded so that the minimum muscle force may accomplish the maximum of action.

The after-treatment is fully as important as the surgical procedure, and must be given prolonged consideration in order to accomplish the best ultimate results.

Arthrodesis alone possesses advantages in cases incapable of benefit from tendon transplantation.

Various forms of osteotomy, osteoclasis, and other bone operations are available for the removal of deformity and for the prevention of undue strain upon the soft parts around a joint.

It is apropos to quote the following from the closing remarks of Dr. Albert Hoffa at the time he read a paper before the American Orthopedic Association:[32] "The results in man have clearly proved that results are to be obtained. . . . The result will depend upon the healthy muscle material available. There must be an overcorrection of the deformity before the operation. . . . Arthrodesis has been satisfactory, but tendon transplantation has given better results."

Where tendons of active muscles were long enough to transplant into the periosteum, the resulting conditions were somewhat better, because of the fixity of the point of attachment, and the greater security obtained in subsequent function of that transplanted muscle. Where tendons were too short to thus obtain a periosteal insertion, Gluck's method reported at the International Medical Congress at Berlin can be used to elongate the short tendon, and thereby obtain a periosteal insertion in otherwise impossible circumstances. This marked the very greatest advance that has been made in tendon transplantation, in that muscles, whether by situation or characteristic function so placed as to be otherwise unavailable, were elongated by tendon lengthening by silk strands. Where the silk strands are properly placed and the proper technique followed, it has been

found that the silk strands subsequently become a mass of fibrous tissue, and the interstices of the strands infiltrated, clearly indicating that they have not been absorbed, but have been the means of permanently establishing a direct line of contact between the active muscle and the periosteal insertion by means of the silk strand.

The great extent to which silk-strand elongation has opened up new fields can be illustrated by cases in which there has been paralysis of the hamstring tendons and control of the knee-joints lost through inactivity. In some such cases as this a part of the erector spinæ mass has been utilized by means of silk strands attached to the lower tendon, the fibrous part of the lower part of the muscle carried down beneath and attached to the periosteum at the upper and posterior part of the tibia. The function in many of these cases has been wonderfully improved, and there seems to be therefore no limit to the possibilities where an aseptic field is invaded in a strictly aseptic way required by the procedure. The operation is not without risk, as shown by the many cases in which silk strands have become detached, leaving the conditions no better than they were previously.

The relaxation of the ligaments around the joints or muscles, which have been either in part or in entirety the seat of the original paralysis, otherwise known as flail joints, have been subjected to various forms of surgical procedure in order to secure stability. Silk strands carefully sutured into periosteum have added materially to the increase in the stability of the joint, thereby increasing the function. In this method it is aimed to reënforce the relaxed ligaments of a joint by using silk strands with firm attachment at each end in periosteum. At times it is necessary to have a limitation of motion rather than excessive action, and the resort to silk strands or silk ligaments frequently efficiently aids in securing the desired object.

In certain joints stability can best be obtained by arthrodesis. This operation is not adapted to patients under twelve years of age, because it has been found that the removal of all the fibrocartilage of joints, thus bringing the bony surfaces into firm contact, is rarely ever followed by bony union in young children, whereas after twelve years of age such an arthrodesis is followed by bony union and greater stability of the affected joint. There are certain joints in the body where arthrodesis can be performed greatly to the benefit of the patient, and there are other joints where such arthrodesis would produce conditions of rigidity that would not materially benefit the patient. The ankle-joint is peculiarly a field where arthrodesis can accomplish the best results. Goldthwait[33] and Whitman have each devised methods possessing great advantages. On the contrary, where the knee becomes rigid, an excessive amount of motion is thrown upon the hips which in infantile paralysis are rarely capable of sustaining a greater strain than that to which they are already subjected.

For a number of years nerve transplantation and nerve anastomosis have been attempted with very indifferent results. In many of the experiments on animals, nerve transplantation has taken place with results that seemed to promise great things for the future in cases of paralysis, but in these animal experiments healthy nerve was transplanted into nerves not previously involved in a process of infantile paralysis, and the results obtained, while illuminating, gave very little clear indication of what could be accomplished where healthy nerve was transplanted into an inactive one. A few cases are on record in which the results of animal experimentation have stimulated operators to employ identical methods in cases of infantile paralysis, and occasionally favorable results have been reported in improved function of the previously paralyzed nerve.

Robert B. Osgood's[34] very sound conclusions are based upon a thorough analysis of the favorable results obtained by nerve grafting in infantile paralysis reported by Spitzy, Ballance and Stewart, Rivers and Head, Langely and Anderson, Kilvington and Dunlap, Taylor, Peckham, Hackenbruc, Tubby, Sherren, Henle, Young, and the convincing reverse statements of Warrington and Murray, that "there have been few

successes and many failures." Osgood says that "in attempting this procedure (neuroplasty) we should at present confine ourselves to operative methods by which, if the end sought is not gained, we shall at least not have added disability to that already existing, and we should have constantly in mind the maxim of Ambrose Paré that the first duty of the surgeon is to do no harm."

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THE RECOGNITION AND TREATMENT OF SOME OF THE COMMONER FORMS OF UTERINE DISPLACEMENT.[1]

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In this paper I have restricted myself to those displacements of the pelvic organs in which descensus or prolapsus of the uterus plays the most important part. They are not only the commoner forms of displacement, but are the ones most prolific in the production of symptoms—symptoms that range in extent from a slight local disturbance to neurasthenia. In this class I have included, besides the ordinary uterine prolapse of varying degrees, the posterior displacements, retroversion and retroflexion as well, for in the latter forms we not only have the organ displaced backward, but with the ovaries and tubes occupying a lower plane in the pelvis.

In order to fully comprehend the significance of abnormal deviations of the uterus, it is of importance to have a proper conception of the normal position of the organ. The uterus has no fixed normal position, but maintains a place in the pelvic cavity in a state of mobile equilibrium, with, however, a constant tendency to an almost horizontal position anteroposteriorly, so that in the erect position, the bladder and rectum being empty, the fundus of the organ is found immediately behind the symphysis, while the cervix, forming an angle with the vagina, is about 2 centimeters anterior to the point of the sacrum. Moreover, the physiological displacement consequent on change of posture, intra-abdominal pressure, filling and emptying of the rectum and bladder, must be considered; and a displacement not regarded as abnormal unless uninfluenced by these conditions. Furthermore, for the purpose of treatment, it is essential that we should be familiar with the structures that maintain the pelvic organs in their normal position.

Briefly, I may state that they are held in place by the upper peritoneal and lower muscular floors. The former, consisting of

[1]Read before the Kensington Branch of the Philadelphia County Medical Society.

the peritoneum, connective tissue, and muscular elements, suspends the organs in their normal position, whilst the lower, made up of the muscular structures and pelvic fascia, gives support below. This is well exemplified in cases of retrodisplacement and beginning prolapse, by the support afforded a relaxed peritoneal layer by a pessary resting upon an intact lower muscular floor. If these structures are deficient congenitally, or weakened by unhygienic conditions during childhood or puberty, or, as is more often the case, the result of faulty obstetrics or improper care during the puerperium, the result is the same. With the relaxation of the upper layer, descent of the organs begins. An instance of this is the development of a simple retroversion or flexion. The uterus drops to a lower plane, the cervix shifts forward, and the loosely swung body and fundus drop back, being influenced to a greater or less degree by the posterior attachment of the broad ligaments. Between the shifting forward of the lower segment and the resistance of the broad ligaments, the organ gradually presents its anterior surface to the intra-abdominal forces and the displacement is accomplished. In retroversion, the body and fundus are displaced backward and downward in the hollow of the sacrum, while the cervix very nearly approaches the symphysis pubis; in retroflexion, the cervix is still nearer the symphysis, and the body is pressed still further downward and backward, forming with the cervix an angle presenting posteriorly.

The evolution of the major forms of prolapse is but a variation of a similar process. At an earlier stage the organ, even in the presence of an intact outer floor, is driven downward in the axis of the pelvic canal into a state of primary uterine prolapse. With relaxed lower structures, however, the sagging vaginal walls, augmented by the emptying of the bladder and rectum, drag the uterus down, and in extreme cases entirely outside the pelvic cavity, into a condition of secondary prolapse.

In considering the diagnosis of these displacements, the physician must not content himself with the recognition of the malposition alone, but he must include all the changes present in the organs that take part in the displacement. To determine these, a systematic examination of the vulva, perineum, vagina, uterus, ovaries, tubes, rectum, and bladder is necessary.

With the backward displacement of the uterus, as a result of the relaxation of the infundibulo-pelvic ligaments, the ovaries and tubes are almost invariably found at a lower level, and frequently in the posterior cul-de-sac. The bladder, on account of its close attachment to the anterior wall of the cervix, is also subject to its effects, not to the degree that occurs in a major prolapse of the uterus, with the displacement of that organ to a much lower level, but sufficient to give rise to symptoms of vesical irritation. The rectum is equally involved in both forms of displacement, but in different ways. The enlarged body, in retrodisplacements, by direct obstruction, is not only a fruitful source of constipation, but its interference with the return circulation is the cause of hemorrhoids and kindred troubles. In uterine prolapse the rectum is dragged down until rectocele, with its attendant evils, results.

If we add to the effects produced by the displaced organs the reactions coming from a congested and inflamed uterus, the ovaries and tubes, and consider the intimate relation that exists between the pelvic organs and the general nervous economy, we can understand why the diagnosis of uterine displacements must include in its scope the associated and complicating conditions as well. As the symptom-complex expressive of these conditions varies from a simple backache to neurasthenia, the diagnosis must depend upon the objective findings alone, which is not always as easy as one would desire.

Often an inkling of the position of the uterus may be obtained by the position of the vaginal portion. If the cervix is in the pelvic axis and the os is directed forward and downward, the uterus is usually retroverted, but may be anteflexed. On the other hand, if the cervix is anterior and is directed downward, it is usually retroflexed, but may be in a state of anteposition. The

distinctions can ordinarily be made by bimanual palpation, but unfortunately, at times, on account of the thick abdominal walls and intestines, the external hand cannot feel the body. When this is the case, the fingers in the vagina are usually able to recognize the body continuous with the vaginal portion of the cervix, and in retroflexion, the angle on the posterior aspect. A further corroboration can be obtained by rectal palpation, it being possible with one finger in the rectum, the other hand making deep pressure over the abdomen behind the symphysis, to outline the body of the uterus and demonstrate its continuity with the cervix.

Occasionally one meets with a case of anteflexion in which the entire cervix is enlarged lying in the axis of the vagina, when palpation through the posterior fornix gives the impression of a posterior displacement, but rectal palpation fails to reveal the body, and closer examination shows a small body anteflexed on a large cervix. Conversely, in the early months of a retroflexed gravid uterus, an enlarged cervix may simulate a posterior displacement, whilst the soft fluctuating globular body resembles a complicating cyst. By careful examination, however, the contractibility of the uterine musculature can be determined, and its continuity with the cervix elicited.

Small cysts, fibroids, remains of hematoceles, and posterior parametritic exudates, may all, from their position in the posterior half of the pelvis and their close connection to the uterus, resemble posterior displacements. Careful attention to the position of the cervix, with vaginal, abdominal, and rectal palpation, will usually demonstrate the presence of the body continuous and movable with the cervix, anterior to the masses, and differing from them in consistency. On account of their fluid contents, cysts are more elastic and sometimes fluctuating; fibroids are harder, and to a degree circumscribed; while the inflammatory tumors are more sensitive, and even painful to the touch.

Uterine prolapse is commonly classified as complete and incomplete. In the former varieties the uterus, accompanied by the prolapsed and inverted vaginal walls, is entirely outside the pelvic cavity. The anterior vaginal wall contains the displaced bladder (cystocele), and the posterior the rectum (rectocele). The cervix and immediate vaginal walls are usually thickened, and often covered with decubital ulcers. As the process may be arrested at any stage of its development, a minor form or incomplete prolapse may occur.

The erect posture is a most excellent one to determine the degree of prolapse, as the uterus frequently slips back when the individual lies down. It is rather an indelicate method, and for that reason rarely practiced. The degree and character of the prolapse, however, can be determined quite accurately with the patient in the recumbent position, by having her bear down and at the same time making traction upon the cervix with the fingers or tenaculum forceps. The question of primary or secondary prolapse can be readily decided by the condition of the vaginal walls. In the former the uterus has descended first and dragged the inverted vaginal walls after it. In the latter the vaginal walls, especially the anterior containing the bladder, has preceded the uterus, and continues to exercise traction upon it. In secondary prolapse not infrequently the uterus maintains its more or less normal position in the pelvis on account of the firmness of the upper floor, and the supravaginal portion of the cervix is elongated, stretched as it were, by the traction of the vaginal walls. The presence or absence of supravaginal elongation is most important, on account of its bearing on treatment. It can be readily diagnosed by placing a finger in the rectum and the thumb on the cervix, while the fingers of the other hand make deep pressure over the lower part of the abdomen. In this way the length and position of the entire organ can be determined. If the subject has thick abdominal walls, a sound may be introduced into the uterine cavity. Elongation gives a length of 12 centimeters or more. Supravaginal elongation must never be confused with hypertrophy of the infravaginal portion of the cervix. The latter occasionally

occurs, and may be recognized by the presence of a large cervix in the vagina, with the body and the vaginal walls in their normal positions. A fibroid polyp and inverted uterus can both be eliminated by careful investigation. In the one the uterus occupies its normal position, and the presenting polyp can be followed up to its normal uterine attachment. In the latter, while the hand steadies the inverted uterus in the vagina, deep pressure behind the symphysis discloses a cup-shaped depression at the former site of the body and fundus. Rarely a cystocele may be mistaken for a cyst of the anterior vaginal wall, and a rectocele for an accumulation of fluid in the peritoneal cul-de-sac. A sound introduced into the bladder, and a finger into the rectum, are always the surest ways of preventing these errors.

As inferred from the foregoing part of this paper, the end result of any operation for the various forms of ptosis of the pelvic organs, and this embraces retroversion, retroflexion, and prolapse, will be wanting unless the function of the upper pelvic layer is restored, besides the correction of any defects that may exist in the lower floor.

The pessary is a mere temporary expedient, and can only be used when there is a good muscular floor. Operations for the repair of the lower plane, alone, are insufficient. Suspension operations, as exemplified by ventrosuspension, fastening the uterus to the lower end of the abdominal incision, or kindred procedures, are unsatisfactory. Nor are those operations that have for their object the proper support of the uterus satisfactory, if done through the lower outlet. To-day an operation of this character, done through an abdominal incision, carries with it little more danger than did formerly an ordinary dilatation and curettement. In addition, entering the pelvic cavity from above affords the opportunity to correct any of the associated and complicating evils. During the past few years I have operated upon quite a number of apparently uncomplicated cases of retrodisplacement, in which the individuals suffered from constant pain and soreness in both iliac regions, symptoms for which there was no apparent cause, the ovaries and tubes not being diseased. In these cases I invariably found enormous varicoceles of the broad ligaments, and at times associated with unusually relaxed infundibulo-pelvic ligaments, that required shortening to maintain the ovaries in their normal position. Surely these conditions would quite likely have been overlooked in a purely vaginal procedure.

For the minor degrees of ptosis, the retrodisplacements, the best operative procedures are those that not only bring the uterus forward and up and maintain it in its normal position, but also take up the slack in the peritoneal layer.

It would be an unnecessary waste of time to even name, let alone describe, the many operations that have been devised for posterior displacements. It will suffice to briefly describe the procedure that I have found in my experience to fulfil every purpose—one that not only maintains the uterus forward at its normal level, lifts up the ovaries and tubes, and relieves venous engorgement, but preserves the natural mobility of the organ as well. There are no unnatural attachments to the abdominal wall, hence complications during pregnancy, labor, or the puerperium are obviated. The strongest parts of the round ligaments are utilized, and with them the peritoneum and adjacent tissue is bunched, thus converting the relaxed upper floor to its normal condition. The one I refer to is the Gillam-Simpson operation as modified by Montgomery.

The abdomen is opened in the following way: A transverse curved incision, four to five inches in length, is made above the symphysis pubis, through the skin and down to and through the true fascia; the true fascia is then dissected from the underlying pyramidali and recti muscles; these muscles are then separated, and the peritoneum incised in the median line for a corresponding length. This method of incision, besides its other good properties, gives a larger fascia surface to which the ligaments can be sutured.

After the various complications have been corrected, the operation is done in the following manner:

First, the round ligament is lightly grasped with a pair of hemostatic forceps, about two inches from the uterus. Second, the ligament is surrounded at a distance of an inch and a half from the uterus by a ligature which is threaded in a Deschamps ligature-carrier. Third, a small opening is made in the anterior fold of the broad ligament, immediately beneath the point at which the ligature surrounds the round ligament. Fourth, introduction of the ligature by means of the Deschamps needle into this opening, and carrying it along the course of the round ligament, beneath the peritoneum, toward the internal abdominal ring. In front of the ring, about one centimeter above the symphysis, and four to five centimeters to the side of the median line, the needle is brought up through the muscle and fascia. The ligature is disengaged from the needle, which is withdrawn, and the loop of round ligament is brought out through the opening. The last step in the procedure is the attachment of the ligament by means of several catgut sutures to the fascia, which has been bared at this point. The same is done on the opposite side. The amount of round ligament sutured to the fascia depends upon the degree of relaxation. The round ligament with adjoining peritoneum is carried into and becomes a part of the broad ligament, thus shortening and strengthening the anterior half of the upper pelvic floor. From Huntington's Studies of the Peritoneum we know that peritoneum thus folded on itself, or kept in apposition with other tissues, rapidly loses its endothelium, and becomes a unified structure.

In the treatment of major ptosis, prolapsed uterus with cystocele and rectocele, the procedures are more complex. In this form of prolapse we have, first, to rectify the deficiencies of the lower floor. A cystocele is almost invariably present, and if not a rectocele, at least a relaxed or lacerated pelvic floor. It has been my practice in the last few years to operate these cases in the following way:

If the woman is less than forty years of age, after a D. and C., the cervix, if hypertrophied, as it so frequently is, is amputated by the double flap method of Schroeder. Second, correction of the cystocele, and upon the proper repair of this condition depends the success of the oper ation. The steps for the correction of the cystocele are as follows: First, median incision extending along the anterior vaginal wall from the cervix to the urethral eminence. Second, complete separation of the vaginal wall from the vesical wall. Third, excision of redundant vaginal wall. Fourth, separation of bladder wall from its connection with the anterior surface of the cervix, pushing it up to its normal level, and maintaining it there by attaching it to the anterior surface of the cervix with sutures introduced at a lower point in the bladder wall. Fifth, the separated vaginal walls are now brought together with catgut sutures. Suturing is done from behind forward, care being taken to include in the sutures the subvaginal fascia.

This operation not only removes the redundant vaginal wall, and places the bladder on its normal plane, maintaining it there by sutures, but does not decrease the length of the anterior vaginal wall, which is of great importance in obviating subsequent traction on the cervix.

The third procedure is the repair of the lower floor. The method of doing this will depend largely upon the presence or absence of rectocele and its size. Any of the modifications of the Simon-Hegar triangular vaginal resection will do. The principles underlying successful pelvic floor repair work are, first, to separate the whole vaginal wall, not merely the mucous membrane (this can best be done with a gauze sponge), from its underlying structures, with removal of as much of the relaxed wall as necessary; and secondly, in bringing the retracted ends of the levator ani muscles together. The vaginal walls can be brought together by interrupted or continuous catgut sutures.

The fourth procedure consists in opening the abdomen, repairing the tone of the upper plane, and maintaining the uterus up

and forward by means of the operation described in the treatment for retrodisplacements.

In those cases in which there is hypertrophic elongation of the supravaginal portion of the cervix, or in women who have entered into the fourth decennium of their lives, after the cystocele has been operated upon (suturing of the bladder to the cervix being omitted) and the pelvic floor repaired, the uterus is removed, either through an abdominal or vaginal incision. In either case the subsequent procedures are the same. The ends of the broad ligaments are sutured together, and the bladder, instead of being sutured to the anterior surface of the cervix, is sutured at a higher level to the anterior surface of the broad ligament stumps. The anterior vaginal wall, to assure its remaining in place, is also fixed to the stumps of the ligaments.

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THE DIAGNOSIS AND TREATMENT OF INTRAVESICAL LESIONS.[1]

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To correctly diagnose the lesions responsible for vesical symptoms it is necessary to take a broad view of the case rather than to limit oneself too early in the examination to a consideration of the bladder alone, lest one make the mistake of diagnosing an intravesical lesion when none actually exists. Lesions outside the bladder may cause symptoms so exactly paralleling those of intravesical disease, producing changes in mobility, sensibility, and character of the urine, the three classes in which vesical symptoms naturally group themselves, that except by a careful examination a diagnosis is impossible. Obviously the converse of this proposition must also be true, and there is abundant opportunity of mistaking intra- for extravesical lesions if a diagnosis of the latter be made on insufficient evidence.

The means at our disposal for the determination of the location and character of the lesion are numerous, but on account of the complexity of the problem presented all must often be utilized to attain an accurate diagnosis, though a shrewd guess founded on the history is not infrequently correct.

The patient's history in so far as it pertains to the health of the genito-urinary organs and the progress of the present trouble is of the greatest possible value in directing the search, while not seldom history entirely apart from all apparent relation to the genito-urinary organs, as in regard to tuberculosis either in his own person or in his family, may be of great assistance in solving a perplexing problem.

The examination of the urine may be placed second to the anamnesis in the systematic examination. This should include the macroscopic examination of the urine voided in several portions as well as the chemical and microscopic analysis in order to determine to some degree the source of an existing pyuria or hematuria, such examination being of greater diagnostic aid than the routine laboratory findings. In selected cases inoculation tests are of value.

But it is upon the physical examination of the patient that the diagnosis of intravesical lesions must depend to the greatest extent. The more general and thorough this is the better; in its most abbreviated form it should include the external genitalia, the prostate and seminal vesicles in the male and the uterus and tubes in women, the kidneys, the nervous system, and finally the bladder.

The examination of this viscus begins with the determination of the efficacy of the bladder muscles to empty the organ; this is determined by catheterization immediately after urination; at the same time may be determined the bladder capacity and

[1] Read before the Philadelphia Genito-urinary Society, Nov. 27, 1911.

also to some extent the irritability of the organ.

Palpation is of value in a few cases, especially when employed bimanually. Large calculi and tumors of considerable size can often be recognized in this manner.

The classical method of diagnosing calculi by means of the vesical searcher is efficient in the majority of cases, though this examination is now usually supplemented or superseded by the *x*-ray and cystoscope.

The last method of examination to be mentioned, the inspection of the bladder through the cystoscope, should be likewise the last method to be employed in practice. From this it should not be inferred that the cystoscope is to be considered as a dangerous instrument or one whose employment should be restricted to a very few cases, being only used where the examiner is at a loss to account for the symptoms without its help; rather its aid should be more frequently sought, as its use is not in any way prejudicial to the welfare of the patient when the manipulations are made gently in the absence of acute inflammation. The object in placing cystoscopy at the conclusion of the examination is to put the examiner in possession of the greatest amount of information possible in advance of his inspection of the bladder, that his interpretation of the changes observed may be as accurate as possible.

For the treatment of intravesical lesions the resources at our command again are very numerous, but not more varied than are the indications for their employment. The effort in each case should be to remove the cause of the condition whenever this is at all possible, depending on this in great measure to secure the cure of the lesions themselves. The causes of the perpetuation of intravesical disease most often met with are faulty drainage and descending infection from the kidneys. Regular or continuous catheterization, either through the whole urethra or through an incision in its prostatic portion, or drainage through a suprapubic cystostomy, or the removal of an obstructing prostate or stricture, are the methods used in combating the former factor. Lesions of the kidneys must receive appropriate treatment, whether this be lavage of the pelves through ureteral catheters or the removal of a diseased organ. Meanwhile the bladder should be medicated through the medium of the urine by the exhibition of drugs by the mouth, and by the more direct means of irrigation, instillations, and topical applications through the operating cystoscope.

Benign tumors may be removed by excision by the transurethral or suprapubic routes, or by desiccation by the Oudin current. The excision of histologically benign papillomata has not been as successful here in producing permanent cures as might be expected from the results obtained with this method in the treatment of similar tumors in other parts of the body. Vesical papillomata show a strong tendency to recur, either at the site of the former growth or at some distant point, even when the whole thickness of the bladder wall is resected with the tumor. For this reason and because the treatment can be carried out without the administration of a general anesthetic and without incapacitating the patient even temporarily, desiccation with the Oudin current, applied directly to the tumor through the catheterizing cystoscope, is the method to be selected whenever practicable.

In the case of malignant tumors of operable extent the choice lies between partial and total cystectomy, the latter being combined with the implantation of the ureters in the bowel or in the skin, or with nephrostomy, as may be deemed advisable, the diversion of the urine being accomplished either at the time of the cystectomy or as a preliminary step a few days prior to the removal of the bladder. The Oudin current may be of value in the treatment of malignant as well as of benign tumors, but as yet its use cannot be advised except when the radical operation is refused, or as a palliative method in inoperable tumors.

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POSTOPERATIVE TREATMENT OF PROSTATECTOMY.

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Much has been written upon the relative merits of the various operative procedures for the removal of the prostate. Many statistics have been compiled to prove which is the better—the suprapubic or the perineal route. It is surprising, upon looking over the literature on prostatic work, how little has been written regarding the after-treatment of prostatectomy, which to my mind is vastly more important than the operative technique. It matters little which operation is performed, if the patient recovers and is relieved of the annoying urinary symptoms, his recovery, in my opinion, depends upon the care and attention given him after the operation.

The postoperative treatment may be divided for convenience into three stages:

First, the period immediately following the operation.

Second, convalescence.

Third, the period covering, at least, six months.

During the first period, that immediately following the operation, the most important elements to be guarded against are shock, hemorrhage, anuria, and sepsis.

In considering shock and its prevention I will be compelled to dwell for a moment upon the preparation of the patient preliminary to the operation. I will consider the question of anesthesia, which, in these old gentlemen upon whom prostatectomy is performed, is of paramount importance. In clean cases—that is, when there has been no existing cystitis either of long or short duration and other things being equal—the operation may be performed at once; if the bladder has been infected, then a week or two of preliminary treatment, for the purpose of rendering the field of operation as aseptic as possible. It is well also to institute constitutional treatment for the purpose of increasing the resistance of the patient.

As little preliminary work as possible should be done upon the patient in the operating-room, and everything made ready for the operation before the anesthetic is given, thus shortening the time of the anesthesia, and reducing the possibilities of shock. It is my custom to have the bladder irrigated and filled and have the skin surface cleansed just prior to the beginning of the anesthetic, the bladder being filled with formalin solution 1:4000, and the skin surface painted with tincture of iodine.

It has been my practice in the majority upon whom I have operated to use nitrous oxide gas and oxygen as an anesthetic. This is safe, rapid, and reduces to a minimum the chances of shock and anuria, and also, as may occur in ether anesthesia, prevents to a great extent the dangers of pneumonia. I feel that one of the exciting causes of shock, particularly in the aged, is the persistent nausea, vomiting, and straining which follows ether or chloroform anesthesia; this is entirely eradicated by the use of gas and oxygen. The patient fully recovers before leaving the operating-room, and is free from the annoying untoward conditions which are so greatly feared when other anesthetics are employed. I am compelled, however, to call attention to one class of patients in whom gas and oxygen anesthesia is contraindicated. If the patient has a myocarditis, then ether is the safest to employ. Gas and oxygen anesthetic is not an easy one to administer, and for the best results it must be left in the hands of the expert. It is impossible for the interne or one not familiar with this form of anesthetic to know the proper mixtures, and to readily recognize untoward conditions.

My anesthetist has given many thousands of gas and oxygen anesthesias, and I must admit I employ it in cases in which ordinarily this anesthetic would be contraindicated. Even when ether or chloroform is used I feel that in these cases in old men it is the safest plan to employ an anesthetist who has had much experience, for the pa-

tient should be kept under the influence of the anesthetic by the use of the smallest possible quantity.

Immediately following the operation and continuing for twenty-four hours hot salines per rectum, by the drop, are employed. This is done in every case, influencing a decided action upon the postoperative shock and anuria. Strychnine is administered in conjunction with the saline for the first twenty-four hours if it is indicated.

After the prostate has been removed, a 32 F. sound, or one as large as the caliber of the urethra will allow, is passed into the bladder, a meatotomy having been performed if necessary to allow the passage of the instrument. The region around the internal urinary meatus is carefully examined; if there are any fragments of tissue these are removed. The bladder is then irrigated with hot formalin solution 1:4000, which will, as a rule, stop the bleeding; only occasionally is it necessary to pack the bladder to control the hemorrhage.

A drainage-tube about 27 or 28 F. in size is inserted, this having thick walls to prevent collapsing, and the bladder is closed snugly around the tube, the structures being brought together with as few sutures as possible, reducing chances of infection. The tube is brought out of the upper angle of the skin incision. The bladder must be drained, as the process of drainage is the most important phase in the after-treatment of the case, as upon perfect drainage depends almost entirely the success of the operation, for by perfect drainage we minimize the danger of shock, anuria, sepsis, and hemorrhage. Drainage in these cases has been the bugbear of operators since prostatectomy has been classed among the scientific, justifiable operations. All varieties of drainage apparatus have been devised. Most of these have been discarded as useless. Some operators use nothing but a tube which drains by gravity, others recommend the use of a tube of large caliber, through which, if the drainage is not perfect, blood-clots, etc., may be removed by the nurse in charge with a long pair of forceps, increasing by this method, as one can readily see, the chances of infection.

The author has devised a drainage apparatus which carries out all of its function automatically and with precision, producing absolutely perfect drainage—the apparatus shown in the accompanying cut, and herewith described:

After the patient is placed in bed the tubing is connected with the drainage-tube

from the bladder. The Y-shaped tube F must be below the level of the patient lying in bed; the reservoir A filled with water, the stop-cock B turned so that the water will drop slowly into the cup C, which, on being filled, tilts and empties itself into the funnel D. The water running down the long tube E into the Y-shaped tube F forms behind it a suction which causes a siphon-

age of the fluid in the bladder. This siphonage may be regulated to occur at any given interval by arranging the flow of water from the stop-cock B which flows into the cup.

I am sure that those who are doing much bladder work have met with the same difficulties in perfect drainage as I have met with in my work, and that if they will take the occasion to use the apparatus which I have devised they will be satisfied with the results.

By perfect drainage you render your patient comfortable, the bladder does not become distended, clots cannot form, the dressings are dry, the bladder cannot fill up, the urine cannot wet the dressings, thus irritating the wound and preventing healing, and cannot trickle into the tissue of the prevesical space and engender sepsis. I have used this apparatus in a large number of cases, and feel, without a doubt, that my satisfactory results have been due almost entirely to perfect drainage.

I might call attention to another important feature of the drainage apparatus herewith described: with its use one can readily tell how much urine the kidneys are excreting. This is accomplished by measuring the fluid in the reservoir, also the urine, blood and water in the receptacle under the bed, subtracting this former amount from the latter, the difference being the urine and the blood. This knowledge is very essential, as it is an aid to know the functional capacity of the kidneys.

I might suggest a precautionary step to be taken in regard to placing the drainage-tube in the bladder. Care must be taken that the end of the tube does not come into contact with the floor of the bladder.

Two cases of anuria have occurred in my practice, produced reflexly by irritation of the tube in the bladder; it was necessary in both cases to remove the tube. Shortly afterward there was a copious flow of urine; there had been no urine in the bladder, as was shown upon removal of the tube, and the tube was proven not to have been blocked in any way. It has been my practice for several years to endeavor by the recognized tests to estimate the functional activity of the kidney, not only in cases in which surgical work is to be done upon the kidney, but whenever it is necessary to operate upon any portion of the urinary tract. It is very important in operations upon the prostate, particularly when the condition has been of long standing and there is danger of kidney complications.

During the first twenty-four hours the drainage apparatus is so set that it will empty the bladder completely every five minutes, during the second twenty-four hours every ten minutes, thereafter every fifteen minutes. The apparatus will carry out its function no matter what the position of the patient; he may be in the dorsal position, may be reclining in bed, or sitting up in a chair. The apparatus is employed for five or six days, when the tube is withdrawn. During the first twenty-four hours a metal catheter 28 F. is passed per urethra into the bladder and the bladder irrigated with formalin solution 1:4000, or followed by an injection through the catheter of one of the silver salts. I prefer a 2-per-cent solution of nargol, which has acted most favorably in my practice for the last six or seven years.

This procedure is carried out daily for three weeks. During the third twenty-four hours the patient is allowed to sit up in bed, and the next day, the fourth day, he is allowed to sit up in a chair. He is encouraged to sit up daily and walk about as much as he can; usually within three weeks the patient may leave the hospital.

From the time the patient leaves the hospital until at least six months have elapsed he should be kept under observation. This sometimes is difficult, owing to the fact that the patient comes to us from a distance; however, his treatment should be carried out by his physician.

I suggest irrigation of the bladder at least once a week for several months, and oftener if there is evidence of pus in the urine; the urethra should be dilated occasionally. After six months I insist upon a cystoscopic examination, and if the blad-

der at this time is normal in appearance, and the patient in a comfortable condition, he is discharged. Keeping the patient under close observation is very important, as complications are so apt to occur. We are familiar with the frequency with which there is the formation of vesical calculus following operation, especially in septic cases. Careful treatment will prevent all these untoward sequelæ.

Many patients come under my observation as cured suffering with symptoms nearly as annoying as prior to the operation—pain, frequency of urination, both by day and night, and a severe cystitis. But if proper care had been given after the prostatectomy there would have been, in the majority of cases, excellent results.

I might suggest that if a well-outlined course of after-treatment be instituted along the lines indicated above the result will be surprising. The patient will be more comfortable during the first few weeks following operation, and when he is allowed to depart he will do so as nearly recovered as it is possible to get these old men.

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DISLOCATION OF THE HIP CAUSED BY INFECTIOUS ARTHRITIS.

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In recent years joint infection occurring during or immediately following systemic infection of the eruptive and other febrile diseases has become recognized as the etiological factor in the production of joint diseases.

The resulting destruction of function varies from the mildest form of limitation of motion to ankylosis and to pathological dislocation. The destruction of the joint surfaces varies from thickening of the synovial membrane to erosion of the articular cartilages. Inflammatory deposits frequently completely obliterate such joint cavities as the acetabulum, the glenoid cavity, etc., while the bones composing the joints ultimately present evidences of bone destruction and altered contour.

The type of infectious arthritis that most frequently occurs in connection with infectious diseases is characterized by the rapidity of onset, virulency of action, generally monarticular in the severest cases, polyarticular in the mildest cases, sudden rise of temperature that has no explanation in the systemic affection, severe local pain, swelling, and redness.

Bradford and Lovett (1911) emphasize the importance of giving due consideration to the presence of the staphylococcus, streptococcus, and the organisms peculiar to the primary disease and to the chronic joint affections that may result.

Late reports of cases generally reveal that the attention of the attending physician had been directed to the concurring joint involvement, but the gravity of the affection or the subsequent dangers have not been given efficient consideration. Acute joint rheumatism or even bone tuberculosis is often ascribed as the cause of the onset of the joint affection, and through error much valuable time is lost in efforts to save the joint from utter destruction.

The onset is so rapid and violent that there is absolutely no resemblance to the insidious onset of bone tuberculosis. The occurrence of the joint involvement during an attack of an infectious disease should be sufficient to direct attention to infectious arthritis rather than to the occurrence of such an affection as acute rheumatism.

The seriousness of the resulting destruction of joint function warrants the most painstaking attention to acute concurrent joint affections that occur during measles, scarlet fever, diphtheria, pneumonia, gonorrhea, etc.

The actual destruction of joint surfaces from the infectious process is often great,

but this is almost always supplemented by alteration of contour caused by abnormal function.

Wolfe emphasized the now well recognized fact that persistent alteration in the function of joints or other structures necessarily results in anatomical changes, sometimes difficult to differentiate from pathological destruction.

Many may hold to the view that without a bacteriological or pathological research of the joints involved the etiology will be unknown.

The object of this paper is to show that by a careful analysis of the onset and clinical course of the process, together with radiographic study, the infectious character will be revealed.

In 1856 Helwig was able to collect a number of cases, 12 of which were post-typhoidal dislocations following arthritis.

Keen in his "Surgical Complications of Typhoid Fever" has records of 142 joints, and out of 84 patients 43 had pathological dislocations.

Cave collected 31 cases of arthritis of pneumococcal origin, and many others can be cited who have proven its infectious origin.

Hare and Beardsley (The Medical Complications, Accidents and Sequels of Typhoid Fever and the other Exanthemata, 1909) speak convincingly of the occurrence of joint affections, including dislocations directly associated with typhoid fever, scarlet fever, and measles. Typhoid spine is considered (page 248), and reference is made to the statistics of Fluss (*Centralbl. f. d. Grenz geb. d. Med. u. Chir.*, No. 8, Bd. xvii to xxi) and Silver (*Am. Jour. Orth. Surg.*, October, 1907).

Attention is directed to joint complications during variola (page 312) with reference to reports upon the subject by Voituriez (*Jour. des Sci. Méd. Lille,* 1903, xxiii, p. 93). Debryre (*Echo Méd. du Nord,* Lille, 1903) and Ingelraus (*ibid.*), "Scarlatinal Synovitis or Scarlatinal Rheumatism," refer extensively to the literature (page 324). Arthritis complicating measles is stated (page 370) to be an extremely rare condition, but certain bone diseases are more common than shown by the very limited literature on the subject. Their explanation is that the development of the bone lesions long after convalescence from the attack of measles has diverted attention from the original infection. The same may be said of varicella, as noted on page 379, and of rubella, page 389.

The points to which attention is now directed are: (1) The Etiology; (2) the disease itself; and (3) the treatment. From the etiological point of view infectious arthritis takes its origin in the majority of instances from the acute infection already present.

Goldthwait, of Boston, has called attention to the fact that the infectious arthritis, particularly in younger children, has a peculiar relationship to infectious diseases. He mentions pneumonia and influenza as frequent causes.

H. L. Taylor shows that all the acute infectious diseases, such as pneumonia, influenza, measles, scarlet fever, typhoid fever, and diphtheria, are capable of exciting joint inflammation.

In regard to the determination of the infective arthritis, Goldthwait says that the method of onset is of great significance, and he further states that an infective process is apt to develop suddenly, and that the fewer the joints affected the more severe will be the destructive changes. It is his opinion that if fleeting symptoms usually referred to other joints during the acute inflammation in the affected joint be absent, then very little can be gained from the history alone to aid in diagnosis.

However, if during an infective disease there occurs in a joint sudden onset of local pain, tenderness with stiffness and spasm, together with the general symptoms of a febrile process, we can, with the knowledge of the already existing infection, make out the etiology of the arthritis.

The old theory of Petit, that hydrops of a joint, the cavity being greatly distended with fluid, the assistance of slight external force, was sufficient to dislocate the head, will be at once practicable.

The Disease.—Whatever the infecting organism might be, it certainly has a very pronounced action on the joint involved.

The acute inflammation has a rapid course, causing early disorganization of joint structure and often resulting in a pathological dislocation, as the accompanying case will illustrate.

There is also a tendency to abscess with a dissemination of so much toxic material into the system as to result fatally after involvement of serous and mucous membranes. However, there may be no pus in the joint, in which case the course is short and little destruction observed.

The signs and symptoms are not unlike any other arthritis, except in the fact that there is an acuteness and constancy of symptoms, a rapid destruction of the articular surfaces, and with the predominating infection are sufficient to establish its entity.

The confounding of tuberculosis and rheumatism with this disease leads to their differentiation at this point.

In tuberculous arthritis the course is slow, coming on insidiously, only trivial symptoms being at first noticed; the condition lasts for months, and may be apparently arrested any time during the first progress of the disease.

There is an early muscular spasm with flexion deformity and free motion absent until months or years have elapsed; oftentimes no motion is ever obtained.

Pain is an intermittent and fleeting symptom, but is always associated.

Joint rheumatism is not a common affection of childhood, nor is there a tendency to suppuration; the characteristic progressive involvement of the joints successively with special tendency to serous inflammations is enough to prevent any doubt concerning it. Rheumatism rarely affects a single joint.

The Treatment.—A case of infectious arthritis of the hip, if seen early before any destruction has taken place, should be immobilized, which is exactly the procedure attempted by nature, viz., the hip being held in slight flexion, abduction, and external rotation. In this position the limb should be maintained by means of the plaster-of-Paris spica, which should be extended to the knee or ankle.

If, however, there are marked toxic symptoms indicative of much necrosis and destruction of articular surfaces, then the joint should be opened aseptically and efficient drainage secured.

When the toxic symptoms subside the child should be placed in a chair and wheeled into the open air.

As soon as the strength will allow, the patient should be made to walk a little with the cast still applied and using crutches as a support. The cast can be allowed to remain for two to six weeks. After the removal of the cast, exercises should be instituted, the autoresisting exercises being the most useful. They should be kept up for an indefinite time with the object of preventing ankylosis.

If the joint is complicated by a suppurative focus and it is on the verge of rupturing, then it should be incised and the cavity cleaned completely with a saline or weak sublimate solution; it should be cleansed until every vestige of infective material has been removed. No curetting of the bony parts is necessary, simply the removal of infective material by means of sterile gauze. The incision is closed without drainage, or left open with drainage, as the exigencies of the case demand. Subsequent closure of the wound can be secured by surgical measures.

If a suppurating focus is observed, but no fluctuation, then a cast may be applied with a fenestrum over the area. The child is removed to the open air, and often the focus will disappear as the general condition improves.

The above method of treatment is peculiarly necessary for several reasons:

1. It prevents friction of articular surfaces.

2. It diminishes the tendency to pathological or spontaneous dislocation.

3. It prevents an overstraining of the spasmodically contracted muscles.

4. It permits of early removal from bed, thus preventing the depressed conditions following long confinement.

5. It induces a useful position for function if ankylosis is unavoidable.

6. The results obtained from its use are very satisfactory. If, however, a dislocation has taken place during the stage of joint destruction, it is necessary that the head should be reduced and retained in a long spica cast. But if such pathological changes have taken place as ankylosis, filling up of acetabulum, obliquity of acetabular rim, with atrophied and contracted muscles, the attempt to reduce is useless. The best that can be done is to neutralize the shortening by elevation of the shoe.

The history and associated facts of the following case will reveal the importance of this method of treatment, as far as the previous discussion is concerned:

Patient, M. G., aged eight years, born in the United States, female, occupation school-girl; admitted to the Orthopedic Department of St. Agnes Hospital July 7, 1911.

Family history: Father and mother living and well; three sisters and two brothers in good health; one brother died from an attack of measles. No history of syphilis or tuberculosis obtainable.

Personal history: Up to January of 1911 patient had good health except for a slight attack of chicken-pox at four years. In January, 1911, she developed an attack of diphtheria, which lasted over a month and from which she entirely recovered. Following the diphtheria in February, 1911, she developed measles with an accompanying pneumonia. She was admitted to the Municipal Hospital. The bacteriological reports confirmed the diagnosis and recovery therefrom.

During the attack of measles the left hip became swollen, red, and painful, the febrile symptoms being more severe during the acute arthritis. She complained of pain of a fleeting character in the knee and ankle. The hip continued the same for about four weeks.

Her condition in the Municipal Hospital became exceedingly grave. The pneumonia superinduced upon measles increased the gravity of the situation. As death appeared imminent, the urgent request of her parents that she be allowed to die at home prevailed. With a temperature of 104° she was taken home without hope of recovery. Bed-sores developed and extreme emaciation occurred. Very gradual recovery took place, a tribute to the skill of the family physician, Dr. Kelty.

In March she was taken to a hospital, and from a study of the *x*-ray plate the condition of the hip was considered dislocation from bone tuberculosis. Extension was made on the affected hip as well as on the unaffected one, a five-pound weight being attached to a cord over a pulley at the foot of the bed. Extension was continued for four weeks.

In April she was allowed free use of her limbs in bed; she could be wheeled about, but walking was impossible, and she suffered still from the inconveniences of a bed-ridden patient, viz., restlessness, lack of appetite, great weakness, constipation, and had ever since the long confinement in bed several bed-sores on the buttocks.

She was in this condition when she arrived at the Orthopedic Dispensary of St. Agnes Hospital in July, five months after her severe illness. On admittance examination showed the appearance of one convalescing from a severe illness, the whole body being greatly emaciated. The left leg was shorter than the right by 1¼ inches; the adductor muscles were contracted; there was great prominence of the left hip, slight widening of the perineum, and the great trochanter was above Nélaton's line. On the right hip no abnormal relationship.

Trendelenburg's test was positive, which is a dropping of the buttock of the unaffected side below the normal level of the other, the patient standing on the affected limb.

On abducting the left limb retraction of the left labium was noticed, the entire pelvis being moved during the abduction. The opposite side showed no signs of joint immobility. The accompanying *x*-ray plate

shows the pelvis in a tilted position, the left portion being elevated. The right hip shows a well-developed femoral head and a normal acetabulum. The left hip shows great disorganization, the roof of the acetabulum is entirely eroded away, and a little above is the crushed and disorganized head of the femur, the head having very much the appearance of a cauliflower growth. There is also an internal rotation of the

Dislocation of the hip caused by infection.

femoral shaft, the bone destruction being superficial and confined to the articulating surfaces.

It is important to emphasize the serious danger of drawing erroneous conclusions from radiograms. From the study of the radiogram without knowledge of the clinical symptoms, one might very readily consider the pathological destruction in this patient as having been caused by bone tuberculosis. If, however, the plate is considered in direct connection with the history of the affection, no other explanation than that here given can be accepted. It is now generally conceded that radiograms alone are valueless or capable of inducing erroneous conclusions. Their great usefulness consists in their being accepted as a part of the clinical investigation.

When the patient first came to the Orthopedic Department in July it was the hottest season of the year, and she was advised to go to the country as soon as possible and to get out of her chair. She was instructed to walk a little each day with the aid of crutches. Daily bathing with massage and autoresisting exercises were advised.

The patient was in the country one month. On the 9th of August she reported in a much better physical condition. She could walk fairly well using crutches, and could walk a little without any aid whatever, although this had been forbidden. Her appetite had increased, the constipation was greatly relieved, guarded attitude lessened, and there was an increase in weight.

On examination the thigh could be fairly well abducted, flexed, and extended, which on admittance was almost impossible. The musculature was better than before. Although the great trochanter still was above Nélaton's line, and consequent shortening of limb, she was in a better physical condition. When she walked the heel was elevated, the weight of the body resting on the toes.

The patient was advised to continue with the ambulatory treatment, still using crutches, and together with massage to perform autoresisting exercises, giving particular attention to the pelvi-trochanteric muscles.

On the 6th of September, about one month after her last visit and two months after admittance, patient reported still improving, the action of the hip-joint being about the same.

The tilting of the pelvis and peculiar gait have caused a slight scoliosis, to arrest which a high heel on the left side has been recommended.

It has been impossible to definitely determine which of the three maladies—*i.e.*, diphtheria, measles, or pneumonia—caused the infection of the hip, nor just when the severity of the symptoms of the hip infection occurred.

The rapid succession of the three infectious diseases, the extremely depressed vitality of the patient, and the apparent impossibility of averting death, concurred in masking the condition of the hip.

It will be noticed that the aim at present in the treatment of this individual patient is to increase as far as possible the muscular development, and as the case progresses to institute other appropriate treatment.

The existing conditions offer no prospect

of restoration of the hip to normal position or function. Careful attention must now be given to the avoidance of subsequent and resulting deformities of other parts of the body, the production of the best possible usefulness of the dislocated hip, and to increase the general health and strength of the patient.

I have had the advantage of frequent consultation with Dr. H. Augustus Wilson both in the study of the patient and in the preparation of this paper, and feel assured that the statements herein made meet with his approval.

MERCURIAL POISONING FROM VAGINAL ABSORPTION.

The *British Medical Journal* of October 14, 1911, quotes a case from the pages of the *American Journal of Obstetrics* and makes the following editorial comment:

The coroner of Allegheny county, Pennsylvania, recently demanded the services of Dr. C. B. Schildecker, of Pittsburg, for the investigation of three cases of fatal mercurial poisoning. In each instance the deceased was advised by a friend to "use" antiseptic tablets.

The first patient was single, and had reason to suspect that she might be pregnant. Her lover went to a druggist, who sold him six 7.3-grain bichloride tablets, and told him to "use" them. The tablets were inserted into the patient's vagina. Intense pain was the result, and the patient could not extract them on account of muscular spasm. About half an hour later a physician arrived and administered vaginal douches of warm water, but failed to find any remnants of a tablet. Within a few hours symptoms of acute mercurial poisoning set in, and the patient died on the fourth day. Dr. Schildecker discovered all the signs of necrotic exfoliative enterocolitis, very advanced, in the rectum, yet traceable as high as the duodenum. The mucosa and muscular tissue of the vagina and vaginal portion of the cervix were necrotic, and necrosis had attacked the Fallopian tubes, ovaries, and broad ligaments, yet spared the endometrium, muscular wall, and serous coat of the entire body of the uterus above the os internum. Thus the chemical irritant had been carried to the uterine appendages, and, further, round by the lymphatics, and not straight along the uterine cavity and tubal canal. There were no signs of peritonitis, but the peritoneum in the posterior part of the pelvis was separated from the underlying tissues by a collection of about 10 ounces of clear serum.

In the second and third cases the patients were young married women, who introduced the tablets in order to prevent conception. As in the first instance, both patients attempted to remove the tablets on account of the burning pain which rapidly followed their introduction, and both failed. The second was treated by continuous enteroclysis, and seemed convalescent at the end of a fortnight, when she died in a state of collapse. A perforation was discovered in the descending colon, with signs of general peritonitis. In the third case the physician arrived within twenty minutes, and immediately gave intravaginal injections of hot water, and, as soon as possible, hot milk. Continuous enteroclysis was then practiced, and the patient seemed to be doing well until the third day, when tremors developed, followed by paralytic symptoms. She died at the end of the first week.

These cases show that absorption of bichloride tablets take place through lymphatics, and is exceedingly rapid; within twenty minutes a lethal dose can be absorbed. The reflex spasm preventing the patient from extracting the tablet is a phenomenon to be remembered. Apart from noting the ethical fact that none of the three patients had any business to introduce tablets into the genital canal, the author points out the evils which may be caused by criminally careless druggists and ignorant friends advising the "use" of these preparations without any warning as to their dangers.

EDITORIAL.

THE RELATIONSHIP BETWEEN PATHOLOGY AND THERAPEUTICS.

Many years ago when our knowledge of the processes of disease rested largely upon post-mortem observations, the employment of remedial measures necessarily depended solely upon experience, and the deductions from this experience were, for obvious reasons, often erroneous. The advances which have been made in the study of abnormal physiology or pathology have, however, given us much clearer conceptions of the conditions which exist in living patients, and while erroneous deductions may still be reached, nevertheless the application of drugs has become more rational and less empirical. There is not space in this editorial to discuss in detail the large subject indicated by its heading, but ultimately, as our knowledge of disease becomes wider and deeper, we will doubtless look back to many of our present methods and consider them as crude as the methods employed by our forefathers.

One of the great advantages possessed by a physician who has opportunities for a large hospital practice is that he studies patients with instruments of precision and, from time to time, obtains autopsies which give him valuable information as to what he ought to do in other cases that come under his care. Such post-mortem observations, combined with a study of the symptoms of disease presented by the patient during life, instead of making him a therapeutic nihilist, will, on the contrary, give him increased confidence in the principles of treatment which he institutes. Thus, a physician who employs certain measures in the treatment of croupous pneumonia, and who nevertheless loses his patient, may reach the conclusion that his methods were erroneous, or that the drugs which he employed were without value, because they failed to maintain the action of the heart when the patient's recovery depended solely upon the proper performance of its function by this viscus; but at autopsy he finds that the real cause of cardiac failure was the development of an ante-mortem clot, the prevention of the development of which is beyond our skill and the occurrence of which necessarily involves a fatal termination. Such an investigation does not throw doubt upon the value of treatment in cases which do not present this fatal complication, and shows him clearly that the death occurred through no fault of his. A very large number of instances of a similar character could be cited, as, for example, the condition of the kidneys in parenchymatous nephritis, in which disease the autopsy will not throw doubt upon the plan of treatment but rather cause amazement that life could have been maintained for so long a time.

In this connection we have read with much interest an article contributed to the *American Journal of Medical Sciences* for December, 1911, by Brooks, upon the presence of myocardial changes in endocarditis. For many years medical men have recognized that the prognosis in endocarditis involving the valves depends not so much upon the deformity of the valves as upon the ability of the heart-muscle, by increased work, to compensate for the leak which the deformity produces. Any myocardial degeneration of course impairs the ability of the heart muscle to do extra work. Brooks's paper emphasizes the fact, too often overlooked, that myocardial disease of greater or less degree is practically always associated with endocarditis. We all know how frequently mitral stenosis is associated with a lesion which extends from the valves into the fibers of the bundle of His and adjacent parts, and this is probably one of the reasons why the prognosis in cases of mitral stenosis is so bad. The myocardial changes, in these instances, may be originally inflammatory in nature, but as a rule they are ultimately of a distinct degenerative type, and in these degenerative cases the muscle suffers not so much by extension

of the endocardial inflammation as by reason of the fact that the microörganisms, or the poisons, which, on the one hand, cause valvular disease, simultaneously affect the muscle fibers. This degeneration is commonly of the fatty type in its terminal characteristics, succeeding the primary parenchymatous alterations, and ultimately, of course, the fatty degeneration is followed by fibrous replacement and the brown atrophy so commonly met with at autopsy.

It will be seen at once that a recognition of these facts not only governs prognosis but also governs treatment, not so much because it directs what drugs shall be used as because it indicates that there are limits to therapeutic possibilities. Given a valvular lesion and a tired heart which has become nearly exhausted in its endeavor to keep up compensatory action, it is manifest that rest in bed and suitable doses of digitalis and arsenic may do much good; whereas, on the other hand, if the degenerative changes in the myocardium are considerable, these remedies of necessity can be of little advantage. Although there is no means of absolutely determining how far degenerative changes have progressed during life, nevertheless a knowledge of the severity of the illness which has produced the lesions at least points to the degree of their development, and where there is reason to believe that the muscle changes are marked, remedies may be used with the hope that they will do good, but with the recognition of the fact that too much cannot be expected of them, and therefore, when they fail, the physician must not be cast down and disheartened. On the other hand, it is equally important that the physician should not protect himself from the criticism of his own conscience by believing that he has exercised his best efforts unless he also feels that he has studied his case with so much care and is so well equipped by the study of diseased processes in general, that the chances are against his having made any mistake in prognosis, diagnosis, or therapy.

THE CUTANEOUS REACTION IN SYPHILIS.

Although the diagnosis of disease is, strictly speaking, a department of medical study which does not have a place in a journal devoted to therapeutics, nevertheless diagnosis is so intimately connected with treatment, when a specific infection is present, that any advance which makes diagnosis more certain and therefore treatment more accurate is worthy of our consideration. The Moro reaction with tuberculin and the reaction of von Pirquet to the same agent have proved themselves useful in a limited class of patients, chiefly children. That they possess all the advantages which were ascribed to them when first introduced is questionable. The same failure to give us the information which we desire may be developed in future in connection with a cutaneous reaction described by Noguchi in the *Journal of Experimental Medicine* of December 1, 1911. This investigator, whose name is so familiar to all those who have studied the literature of syphilis during the last ten years, records his investigations along this line. Preparing an emulsion, or extract, of pure cultures of the treponema pallidum to which he has given the name "luetin," he has applied this to the skin of many individuals in different stages of syphilitic disease with interesting results. The luetin produces a cutaneous reaction in syphilitic and parasyphilitic patients which is most constant and severe in tertiary and hereditary conditions, and is comparatively rarely present during the primary and secondary stages of the malady. Indeed, in the Noguchi series of cases of late syphilis it occurred in practically 100 per cent, and in 96 per cent of hereditary syphilis. Where the treatment has been very energetic and signs of syphilis are absent the reaction may be quite marked even in the primary and secondary stages; whereas it is often absent if treatment has not been instituted. Noguchi makes the additional interesting statement that this is also especially true in the cases treated with

salvarsan. That cases under active treatment should react better than those which are not treated is noteworthy. He has also found that mothers who have young syphilitic children usually give the reaction, although they may present no evidences of syphilis. On the other hand, it will be remembered that the Wassermann reaction is fairly constant in primary and secondary syphilis, and is directly and immediately affected by antisyphilitic treatment in the sense that its occurrence is diminished. Noguchi's communication is only a preliminary one. He promises us further information along these lines, and it is to be hoped that a test so readily employed will prove reliable.

THE SAFETY OF CHLOROFORM IN LABOR.

It has long been known that the highest mortality from the administration of chloroform as an anesthetic has occurred when this drug was employed by dentists, not necessarily because this class of practitioners is less skilful in its use, but probably because the drug was commonly administered when the patient was in the sitting rather than in the prone position, and therefore the fall of blood-pressure, which is so characteristic of the early influence of chloroform, exercised a greater effect upon vital centers. Conversely, it has been universally recognized that the mortality rate from the use of chloroform during parturition is extraordinarily low. It has been thought by some that this was due to the fact that less chloroform was used, and by others that the immunity of the parturient woman depended upon the fact that hypertrophy of the heart, which is supposed to develop during pregnancy, acted as a protective; but these two reasons seem hardly adequate, since the chloroform is often given to the parturient female by unskilled hands while the physician is busy with the delivery. Further, it is a question whether there is any actual hypertrophy of the heart in pregnancy which would enable it to resist chloroform. Finally, it has been pretty well proved that, except in cases of myocardial disease, chloroform does not produce death by its direct action upon the heart. It would seem that a more reasonable explanation for the immunity of this class of patients to chloroform depends upon the fact that the patient does not take it constantly, and furthermore that each succeeding pain acts as a distinct stimulant to the vasomotor center which is ordinarily much depressed by this drug, it being well known to physiologists that pain produces a marked rise in blood-pressure.

That death does occasionally ensue from the use of chloroform in labor must, of course, be recognized, and a case of this character has been reported in the *Atlanta Journal-Record of Medicine* for November, 1911, by Hodgson, who records the case of a woman of 24, a primipara, who was delivered by the aid of forceps. She had been in hard labor for some time. After what was apparently a moderate amount of chloroform had been used the patient stopped breathing, just as the head passed over the perineum, and all efforts at resuscitation failed. There is no record of an autopsy to reveal the condition of the heart, but it is said that the patient had the appearance of a normal, healthy woman, and that at no time was she very deeply under the influence of the anesthetic.

THE ABORTIVE TREATMENT OF GONORRHEA.

From time to time there appears in current literature a somewhat enthusiastic advocacy of the abortive treatment of gonorrhea, usually based on the report of very few cases, and at times uncontrolled by microscopic and bacteriological investigations. The basis of this treatment has usually been an extremely irritating injection which is supposed to supplant by an acute chemical inflammation the cellular tissue reaction due to the multiplication and spread of the gonococci, and to eliminate the latter from the urethral mucosa in the process of desquamation and exfoliation and exudation, the latter presumably exerting a gonococcicidal effect. In review-

ing this subject Montfort (*Revue Clinique d'Urologie,* January, 1912) notes that in the abortive treatment the medicinal agents most employed are potassium permanganate, silver nitrate, protargol, and argyrol.

Guiard more than ten years ago contributed an apparently convincing article as to the value of copious irrigations with potassium permanganate, using strengths varying from 1:10,000 to 1:6000 repeated twice daily for four days and thereafter for once daily in quantities somewhat over a pint, after preliminary cocainization of the urethra. Of those who came to him with discharge of less than a day's duration 87 per cent were cured. When the discharge existed for two days 83 per cent were cured; for three days, 60 per cent; for four days, 25 per cent. The treatment lasted for from four to eight days.

Lebreton three years ago reported nine cases seen within the first twenty-four hours of the discharge, all cured by copious irrigation of 1:5000 potassium permanganate practiced twice a day for four days, the patient using the same solution with a hand syringe every four hours between times. After the fourth day single daily irrigation was given and two injections. This treatment lasted for from three to fifteen days. Further experience showed the treatment almost equally efficacious in his hands.

Motz reported last year upon 186 cases, 48 of which were cured in less than ten days; 66 in less than fifteen days; 47 in less than twenty-one days; 2 within four weeks, 2 within five weeks, 3 for a longer period than five weeks. The potassium permanganate was preceded by an injection of between half a drachm and a drachm of 2-per-cent silver nitrate, which was kept in the anterior urethra for two minutes. Twelve hours later the anterior urethra was copiously flushed with permanganate solution 1:1000. The second, third, and fourth day there was a permanganate flushing of 1:2000 in the morning; in the evening, after cocainization of the urethra, a urethro-vesical flushing of 1:2000 to 1:3000. On the fifth day and thereafter a single irrigation of both urethras with potassium permanganate 1:2000 to 1:3000 was done, continuing this washing until all secretion disappeared and the first urine was absolutely clear. The particular advantage he claimed for his method was not only the promptness of cure, but the entire absence of all complications. He advised, however, careful selection of those to whom this treatment might be applicable, rejecting cases of discharge of more than six days' duration, those exhibiting a red and swollen meatus or abundant discharge, marked ardor urinæ, or hypersensitiveness of the urethra, or cloudiness of the second portion of urine passed.

Engelbrecht injected one pint of one-half-per-cent silver nitrate solution with about four feet of pressure into the anterior urethra, previously cocainized, subsequently cauterizing the mucous membrane and navicular fossa with 3-per-cent solution. Four hours later the urethra was again cocainized and a second lavage of one-fifth-per-cent silver nitrate was given. This ended the treatment. Of 30 cases, 26 were cured at once; four recurred.

Moran reports on this method favorably, and Montfort observes that in six cases offering the indications for treatment he had three successes and three failures.

Stockmann advocates the employment of protargol in doses of 4, 5 and 6 per cent, with 4-per-cent glycerin and 5-per-cent antipyrin added, introduced by means of a kind of instillator into the neck of the bladder. The injection is held in for from twelve to fifteen minutes. The treatment is repeated every third day whether the gonococci have disappeared or not, and the patient uses a weak hand injection of protargol one-half to one per cent. Of 100 cases submitted to this treatment, in 38 the gonococci had disappeared from the first treatment; in nine cases after eight days; in fourteen cases after two weeks.

Carle also uses protargol in two- or one-per-cent solutions, the patient giving himself the treatment three times a day and holding the solution in from three to ten minutes. This treatment is continued for

twelve days. Two injections a day are given. All treatment ceases after the fifteenth day. The injection is not stopped even in cases complicated by posterior urethritis, cystitis, or prostatitis. When the anterior urethra is acutely inflamed ichthyol is ordered in one-per-cent solution, held in for two minutes three times a day. Statistics are not given, the author simply stating he has had excellent results.

De Sard employs a 10-per-cent solution of argyrol, 2½ drachms at a time, held in for six minutes, and repeated once daily.

Janet employs two lavages a day during the first two or three days—1:2000, and 1:4000 thereafter from two to six days. He uses, also, a hand injection in strengths varying from 5 to 20 per cent. In successful cases the disease clears up in five to seven days. In the most unfavorable cases the duration of the treatment is less than a month. In 26 cases treated he has cured 17.

There is a general consensus of opinion as to the value of irrigations, and in cases of total urethritis the importance of making these washings total. It is evident, however, that the hand syringe has by no means been thrown away, nor have balsams by the mouth fallen into popular disfavor.

GONOCOCCAL ARTHRITIS.

Among the most troublesome affections with which surgery has to deal are the deforming and crippling arthritic lesions, often gradual in onset, slow in progress and singularly resistant to treatment, dependent upon chronic gonococcic infection. Although this form of arthritis is often monarticular, it is by no means invariably so, and at times produces not only permanent crippling, but in addition chronic invalidism incident to subacute inflammatory attacks. The diagnosis of the gonococcic nature of the infection is dependent primarily upon finding the focus of infection, as is also the treatment. The arthritis does not differ clinically in itself from any of the other forms of persistent and chronic infection.

The usual focus in the male is the seminal vesicle or the prostatic urethra, often unsuspected and undetected, since these chronic inflammations may persist for years and give practically no localizing symptoms. In the female the usual focus is the cervix. From the diagnostic standpoint the complement fixation test is the most promising one that has yet been practiced. The principle is precisely that applied to the diagnosis of syphilis, and the findings are apparently even more dependable.

As to the treatment of these chronic gonococcic joint infections little is accomplished by local means. The remarkable results achieved by Fuller incident to extirpation of diseased seminal vesicles indicate the efficiency of ablation of the focus of infection. Results less striking, but often entirely satisfactory, are at times achieved by massage and irrigation when the vesicles and the prostatic urethra are the seat of infection. In certain cases the injection of vaccines has proven almost miraculous. Stock vaccines have generally been employed, but where this is possible an autogenous vaccine is decidedly to be preferred. The application of heat, pressure, and counter-irritation, and the giving of formalin injections, are carried out on the principles applicable to chronic arthritis in general.

REPORTS ON THERAPEUTIC PROGRESS.

THE TREATMENT OF THE VACCINATION SITE WITH PICRIC ACID SOLUTIONS.

The London *Lancet* of November 18, 1911, contains an article on this subject by SCHAMBERG and KOLMER. These are their conclusions:

1. The use of a 4-per-cent alcoholic solution of picric acid upon the vaccinated area forty-eight hours after the insertion of the lymph does not interfere with the success of the vaccination.

2. It is believed that this treatment lessens the degree of the local inflammatory reaction.

3. It is believed that the patients are not so apt to exhibit constitutional disturbance.

4. The epithelial covering of the vaccine lesion is hardened, and there is a decreased liability of extraneous bacterial infection. This is doubtless due in part to the antiseptic properties of the solution applied.

5. It has been determined by laboratory investigation that picric acid is about four times as efficient as phenol as a local antiseptic.

6. The common organisms on the skin are lessened in number by the application of solutions of picric acid.

THE SURGICAL REQUIREMENTS OF NARCOSIS AND THE AVAILABLE METHODS.

BUXTON in the *British Medical Journal* of November 4, 1911, in writing on this subject reminds us that a class of cases which are difficult to manage is that which includes goitres and glandular growths pressing upon or displacing the trachea. Involvement of the laryngeal nerves increases the danger. There is a complication in goitre cases which is sometimes lost sight of—the tendency these patients have to profuse secretion both from the salivary and tracheal glands. When the thyroid enlargement is associated with the other symptoms of Graves's disease the acme of danger is attained. Chloroform used by the older methods led to, or was associated with, a high mortality, and this led Kocher and others to extol the merits of local injections by Schleich's infiltration method. This plan, admirable though it is in small adenomatous cases, fails to remove one grave factor causing fatality—it does not abrogate either traumatic or psychic shock. Nitrous oxide, even with oxygen, causes too much turgescence, and increases respiratory difficulties. With ethyl chloride the patient is either too deeply or too lightly narcotized; the level of anesthesia can hardly be maintained. Ether given by closed methods undoubtedly increases turgescence, and provokes increase of saliva and mucus, which interfere with breathing. Mrs. Dickinson Berry, who has used an open ether method largely in these cases, insists that with care it can be safely and advantageously employed.

The safest method if ether is used is to inject atropine gr. 1/100, or this together with morphine and scopolamine, half an hour before giving ether by the open method. In this way a certain diminution of the bronchial secretion can in some cases be obtained, but in the experience of the author this dose of atropine will not always prevent salivation, and if it does, it is liable to cause discomfort for hours, owing to the dryness of the mouth and pharynx.

The author has given anesthetics to a large number of cases of goitre, both simple, malignant, and exophthalmic, and has used chloroform in low percentage vapor with a copious stream of oxygen. This plan has so far answered extremely well, and possesses the great advantage that one can readily lighten and deepen narcosis as the steps of the operation demand. Although he has never employed rectal etherization for these cases, he has done so for laryngectomy, but the plan, valuable as an alternative, has inherent objections which make it less useful now that we possess accurate means of giving chloroform in definite percentages.

A SIMPLE AND EFFECTUAL MEANS OF ADMINISTERING SALVARSAN.

In the *Indian Medical Gazette* of October, 1911, FOWLER states that finding the ordinary procedure that is recommended very tedious and troublesome, he tried the mixture of salvarsan with olive oil, and was surprised at the results. The local pain was practically *nil,* and the patients improved rapidly under the treatment, as is recorded by the injection of salvarsan in saline solution. The procedure adopted is as follows: A Roux's syringe with a short needle of fairly large bore is sterilized by boiling in water. An ounce of pure olive oil is boiled in a small aluminum basin, and the oil is allowed to cool, or if one is in a hurry the basin is put into some cold water.

Two cubic centimeters of oil is drawn up in the syringe with the needle on—the piston is drawn well up to the top and the oil is shaken up, so that the oil adheres to the sides of the glass barrel. The piston is then completely drawn out, a finger being placed on the point of the needle (which is lowermost), so that the oil may not run out; next the salvarsan is thrown into the barrel, and 4 Cc. of oil is poured on the salvarsan direct from the aluminum basin. The piston is then replaced, and as soon as the washer engages the barrel, the syringe is turned up, so that the needle is uppermost. The screw-cap which is on the piston rod is then pushed up and screwed home, and the syringe is violently agitated.

The salvarsan mixes with the oil and forms a uniform emulsion. This is injected intramuscularly into the gluteal region.

The points that should be noted are:

1. The piston of the syringe should not be of metal. The syringes supplied for salvarsan injections by chemists are unsuitable for this purpose as the acid salvarsan attacks the metal and the piston jams.

2. The needle must be of wide bore.

3. Care should be taken when the piston is being replaced, the glass barrel being held firmly in its metallic casing with the left hand. The author advises those wishing to try this method to practice it with some simple oil.

4. There should be no hurry in the mixing, as the whole of the salvarsan will mix up with the oil. He has had no caking of the salvarsan in the syringe.

The elaborate method recommended for the use of this wonderful remedy makes it impossible for the ordinary medical man to administer the drug, but the method suggested is one that can be tackled by any average physician. The author injected eight cases recently by this method and has had excellent results.

HYPODERMIC INJECTIONS FOR THE SECONDARY ANEMIA OF CHRONIC PULMONARY TUBERCULOSIS.

BARLOW and CUNNINGHAM in the *Journal of the American Medical Association* of October 28, 1911, state from their experience that the following conclusions seem justifiable:

1. The subcutaneous or intramuscular injection of sterile solutions of arsenic or iron, or of the two in organic combination, is entirely practicable in the treatment of the tuberculous in sanatoriums.

2. The effects of such medication are seen chiefly in the changes in the blood and in the body weight.

3. The preparations of iron seem to affect the hemoglobin content more profoundly than they do the number of red blood-cells.

4. The preparations of sodium cacodylate and of atoxyl seem to affect the number of red cells more markedly than the hemoglobin.

5. These solutions are in no sense specifics against the tubercle bacillus, but seem to exert a general tonic or alterative action within the organism.

6. The use of these preparations is entirely safe and not attended with danger to the patient, even when continued over a period of many months.

7. Relatively larger doses are borne when given thus than are tolerated when given by the mouth.

8. The dosage is capable of exact control, and the amount of the drug absorbed is known definitely.

9. The body weight is more rapidly and

more certainly raised when these preparations are employed than when the unassisted hygienic-dietetic form of treatment is maintained.

10. There is no demonstrable increased liability to pulmonary hemorrhage accompanying the use of these preparations in pulmonary tuberculosis, even with advanced cases and in the presence of progressive destruction of the lung.

VACCINE THERAPY IN ACUTE RHEUMATIC POLYARTHRITIS.

WOLVERTON in the *Medical Record* of October 28, 1911, admits that six cases do not form a large series from which to draw conclusions; but all his cases were of a very severe character, and the response to the exhibition of streptococcus pyogenes vaccine was in every case so prompt and satisfactory that he has felt impelled to report his cases and to urge others to give the remedy extensive clinical trial. Moreover, in at least four of the six cases, the salicylate treatment was not followed; and in two cases the patients grew worse in spite of faithful adherence to salicylate treatment. So the uniformly good and prompt results must be ascribed to the vaccine. In every case the temperature quickly fell, there was a rapid cessation of pain and disappearance of signs of inflammation. The patients, moreover, remarked a feeling of exhilaration, or stimulation, which came on in from three to forty-eight hours after the inoculation. In no case was there any evidence of a harmful negative phase. In none of the six cases above reported did any cardiac valvular lesion develop subsequent to the employment of the vaccine.

Considering the unsettled nature of the question as to the specific etiological microörganism in this disease, it seems not unwise to the writer to employ a mixed vaccine, containing streptococcus pyogenes and staphylococcus aureus et albus, rather than the streptococcus alone. However, the plain streptococcus vaccine used in the cases reported above left nothing to be desired.

The vaccines employed in the treatment of these cases were all "stock" vaccines, made from several strains (at least six, he believes) of streptococci, obtained from various cases of streptococcic infections.

THE FEEDING OF BABIES.

SPRIGGS in the *Clinical Journal* of November 1, 1911, writes on this topic and says with regard to the food that there are three things to do: First, find out what the baby will keep down; next, increase gradually the amount of the food which the child will tolerate; and last, pass gradually from this to a normal diet. If the child is on a certain feed of milk and water, and has not been sick but is marasmic, do not change it, but go on increasing its quantity and strength. If the child has been sick one will find it an advantage to try the modification of milk, using first citrated and then peptonized milk. If there is still sickness, milk should be replaced by albumen-water or by whey. Albumen-water is made by putting white of egg to water, in strength varying from two to six eggs to a pint of water. The writer does not think there is any disadvantage in using the white of six eggs to the pint of water with a little salt. Sometimes a little brandy is put in, but most infants are as well without that. Be sure it is filtered, and that the albumen is broken up, so that there are no flocculi produced in the child's stomach. Often the child will retain this when it cannot take milk at all. Such treatment will change the flora of the intestine, the vomiting and diarrhea ceasing as a result. Whey has a different character, consisting chiefly of lactose. The caloric value of whey is about one-third that of milk. One must try these various foods, passing from one to the other without undue haste or delay.

He speaks of a case of a child of two months which was about 6 pounds in weight when it was born. It was tried with milk and water, but rejected it. It was then tried with peptonized milk, and it rejected that. When the statement is made that he tried it, the writer does not mean for one

feed, for that is not trying it, but for two or three feeds at least. Then it was given whey and that was kept down well. He then wanted to increase the food value, and cream was added to it. That did not suit the baby at all; it began to vomit as soon as it had the food to which cream had been added. Therefore the cream was omitted and peptonized milk was added, putting in first a few drops, and then an increasing quantity of peptonized milk. It was then gradually led to a normal diet of milk, water, and lactose corresponding with the age of the child.

Sometimes neither whey nor albumen-water suits a child. One may then give meat juice, either fresh meat juice made in the way described in the hospital pharmacopœia or veal tea. It may be asked why veal instead of beef? More soluble protein is obtained from veal than from beef, and veal tea is often better borne. It is made in the same way as beef tea. It is well borne by children. Often one can add to its value by putting cream in it, and can keep the child going very well for some days, afterward leading it back to milk again.

There was the case of another child who was fed on citrated milk and water and lactose. That failed. It was then put on meat juice, which it kept down. This was then mixed with whey, and gradually it passed from that to peptonized milk and lactose mixed with it, the time of peptonization being gradually reduced until it was taking ordinary milk mixed with water and lactose. The physician must try all these dodges, and not be afraid to go back again if a change is unsuccessful. Often if one solution does not suit the child a weaker solution may. On the other hand the opposite is sometimes the case. For instance, the writer asserts he has seen children on three parts of milk to one of water vomit, but take peptonized milk or food made from dried milk and keep it down well, getting much more nourishment in a smaller bulk. Sometimes it is the quality of the food which annoys the stomach, sometimes it is the bulk of it. We should not let a preliminary fall of weight be discouraging if the child is taking its feeds. In a number of the sixty-one cases which the author has observed the weight fell at first, but rose afterward. But the opposite may happen; it may go up for a few days and afterward it may fall again. If it is a weakly child it is well for it to cry lustily once a day, because some of these children get atelectasis. Dr. Holt recommends that a marasmic infant should be made to cry daily by smacking; or it may be dipped into cold water, then into warm. The contrast will cause it to cry lustily.

As to medicines, it is wise in gastro-intestinal derangement to give a little castor oil at first to clear out the canal, and afterward half a grain to one grain of mercury with chalk if it is a well-nourished child three months old. For a little infant a quarter of a grain is enough. If the infant is *in extremis,* give it a bath in which is placed some mustard, and inject saline solution under the skin or into the peritoneal cavity.

QUININE AND UREA HYDROCHLORIDE AS A LOCAL ANESTHETIC.

Boyd says in the *Medical Record* of October 14, 1911, that he has reached these conclusions:

(1) In a few of his first cases the author commenced his operation before the part was completely anesthetized. He would suggest that an interval elapse of at least ten to twenty minutes. (2) Postoperative anesthesia lasted on an average three days. (3) No dermatitis followed its use. (4) It is less expensive than cocaine. (5) It is soluble in both alcohol and water. (6) It has a very decided hemostatic effect. (7) There has been some induration in the majority of his cases. At the end of three months this had disappeared in nearly all of them. (8) Some cases have been reported in which the salt was successfully used in major operations. Thus far he has used it only in minor operations. (9) Any operation usually done with cocaine can be done with this anesthetic. The technique is precisely the same.

THE EFFECT OF SPARTEINE AND ADRENALIN INJECTIONS ON THE KIDNEY OF THE RABBIT.

CHRISTIAN, SMITH and WALKER in the *Archives of Clinical Medicine* of October 15, 1911, report an exhaustive study on this subject.

Walker and Christian have described the production of cardiac lesions—myocarditis, pericarditis, endocarditis—in rabbits by the injection of sparteine sulphate (0.01 to 0.04 gm.) and adrenalin chloride (0.1 to 0.2 Cc. of a 1:1000 solution). In some animals the sparteine was given subcutaneously and the adrenalin intravenously, but in most cases both drugs were injected intravenously. The authors have examined the kidneys from twenty-nine of these animals.

Macroscopically the kidneys did not show any departure from the normal except in occasional instances when they appeared injected. This injection did not bear any apparent relation to the cardiac condition, but was evidently independent of it. Microscopically no lesions were found which in any way could be associated with the injection of the drugs. A few of the animals showed some spontaneous lesions, as the writers have mentioned in connection with studies on the kidneys of rabbits which received uranium nitrate and other kidney irritants. These spontaneous lesions occurred in rabbits autopsied from one hour to two or three days after the injection of sparteine—much too soon for any causal relation to exist between the drug and the histological finding in the kidney. The chronic lesions consisted of a slight connective tissue increase—in one or two instances with some dilatation of the renal tubules.

Nearly all the sections showed a marked injection of the vessels, especially those of the glomeruli and medulla. Sometimes only the vessels going in from the cortex were markedly congested. In some of the kidneys this condition was extreme, making the whole section appear very red under the microscope. In no case, however, was it possible to find any evidence of the breaking through of the blood into the spaces without the vessels. Apparently simply an unusual amount of blood was present in the vessels at the time of death. An attempt was made to match up the more bloody sections with the more severe cardiac conditions, but no constant relationship was found. In some instances, however, the kidney sections of animals dying in convulsions were greatly injected, but even this was not an unfailing condition.

No test of kidney functions was made with these animals.

So far as this study goes it supports the statement made by Fleisher and Loeb that injections of sparteine and adrenalin cause no lesions in the kidney.

THE TREATMENT OF PLACENTA PREVIA AT THE SLOANE HOSPITAL FOR WOMEN.

CRAGIN is quoted by the *Medical Record* of October 14, 1911, as reporting cases of placenta previa occurring in 25,000 consecutive deliveries. For discussion of treatment they were divided into two groups, namely: Series A, those occurring in the first 20,000 deliveries; and Series B, those occurring in the last 5000 deliveries. In Series A the cases of placenta previa were treated by different methods: By Braxton-Hicks' version and using the half breech as a uterine tampon, or by tamponade of the cervical canal and vagina, or by dilatation of the cervical canal by the Voorhees bags. In Series B the methods of procedure in cases needing any treatment save that of a normal delivery could well be summarized as follows: (1) Dilatation of the cervix and control of the hemorrhage with the largest Voorhees bag which could be introduced—*i.e.*, No. 3 or 4. (2) After the largest bag had passed the cervix and good dilatation was obtained, either a version was done and the child delivered by the breech, or if the placenta previa was lateral, or in some cases even marginal, with slight hemorrhage, and the vertex was presenting, the membranes were ruptured and the head was allowed to come down and exert pressure on the lower uterine segment and the edge of the

placenta, the delivery being expedited by the forceps if necessary. This use of the elastic bag was extraovular, the membranes being kept intact until the bag passed the cervix and good dilatation was obtained.

The first question of importance in any method of treatment was the maternal mortality. In Series B, treated by the present methods, there were forty-nine cases of placenta previa, fourteen of the complete and thirty-five of the incomplete variety. There were two deaths among those of the complete variety, or 14.2 per cent, and two deaths in the thirty-five in the incomplete variety, or 5.7 per cent. In Series A, treated by different methods, there were thirty-nine cases of complete placenta previa with nine deaths, or 23 per cent, and 135 cases of incomplete placenta previa with eleven deaths, or 8.1 per cent. As regards fetal mortality, in Series B, treated by present methods, the total fetal mortality was 51 per cent, while in Series A it was 60.3 per cent. In Series B 63.1 per cent of the children viable on the admission of the mother left the hospital alive.

Regarding the question of placenta previa being an indication for Cæsarian section, he could only state that he had never met with a case in which he had considered it indicated. He believed that the indication occasionally arose. He had recently performed it in a case of accidental hemorrhage with long, rigid cervix, with profuse hemorrhage, and believed that similar conditions in a placenta previa might well indicate the same operation. That Cæsarian section was often indicated in placenta previa he did not believe.

SOME POINTS IN THE TREATMENT OF EPILEPSY.

The *Journal of Mental Science* for October, 1911, contains an article by COLLINS on this topic based on his institutional experience.

The author has no new treatment to bring forward, but has thought it might be of interest to present a few results of the present methods. He divides his remarks under the following headings: (1) Colony life; (2) dietary changes; (3) the bromides; (4) salts of calcium; (5) opium; (6) digitalis.

The colony treatment in his opinion is ideal. The almost complete absence of restriction of liberty within a certain area, the open-air employment and other forms of employment which are interesting, avoid a great deal of the trouble so constantly found in asylum life amongst this class of patients. There is always a great physical improvement in the people who are in the open air, as far as weather will permit, practically all day. Each villa is built for thirty-eight people, who are in charge of a married couple assisted by one other attendant, and each attendant takes a farm party of about twelve; ten remain in the villa in the morning to do the cleaning, and a tailor's shop, boot shop, weaving and upholstering, and clerical work in the stores are all utilized for the employment of colonists. They have no airing court, and there is no fence to the grounds, but parole and observation work satisfactorily, and escapes are very few. The women, of whom there are sixty, do laundry and kitchen work and mending, and also make the clothing required. It was thought, however, that it would be advisable to have one villa with an enclosed garden, so that all types of epileptics could be admitted for trial, and a new hospital villa of the most recent type to accommodate fifty acute patients has just been erected and will shortly admit patients.

With regard to changes in dietary, the author's results are somewhat contradictory. In May, 1907, the quantity of meat given per day was halved (from 5 to 2½ ounces), and puddings were given. From January 1 to April 30, 1907, 9981 fits are recorded, and from June 1 to September 30, 8680 only. This works out at a reduction of 13 per cent, but remembering that in the later months the weather is finer and more time outdoors is possible, perhaps this might unduly favor these months. For comparison he also took the period January 1 to April 30, 1908, and finds 7916 fits only.

On the contrary, he finds less fits per night after a meat dinner than after fish, the difference, however, being trifling. These results are in favor of a reduction of meat, but apparently not of its complete absence, and when one considers the monotony of the purin-free diet, its results seem hardly worth the inconvenience to, and discontent of, the patient. These remarks refer only to chronic patients, however, and in more recent cases there is no doubt that the diet makes a great deal of difference in some individuals.

The effect of the bromides is variable, some patients being quite unable to do without them, while others cannot take them in any form, even when salt is eliminated from the diet and the dose is small. The author believes that the epileptic fit is reflex in origin, and that the bromides act by raising the resisting power of the brain-cells to external stimuli. For this reason their use is always fraught with danger to the mental activities of the patient, and one cannot help wishing that the bromide treatment was less extensively used during childhood. He has noted the following bad effects from bromides: Great physical reduction, hallucinations, malaise, stupor, degraded habits, edema and cardiac debility, a general lowering of the resisting power to disease, so that sudden changes in the temperature are very likely to be followed by bronchitis and pneumonia. On the other hand, in chronic epileptics who have been on bromide for many years the omission of the mixture has in many cases been followed by one or more of the following results: Increase in the number of fits, and also in their severity. Two cases sprained an ankle during the fits, and in one ecchymosis of face and neck occurred. Attacks of mania, and a greater degree of malaise following the fits, also were noted. In one case, a female who had been taking strontium bromide gr. xxx twice daily for several years, the bromide was omitted because she had an attack of pleurisy with effusion. A slight increase of minor attacks occurred as she got better, but after getting up and when convalescent she had 129 minor attacks in a week. Potassium bromide gr. xxx twice a day stopped these very soon. A few cases are quite uncontrollable without bromide from mental excitement, contradicting some who are more irritable when they have no fits. In several cases no evil results have occurred, but physical and mental benefit have ensued.

In some cases bromide abolishes the aura of the fit, and causes the patient to fall and injure himself in a way he did not do previously. In two cases with prolonged aura the writer has been able to avert fits for several months by simply giving a dose of bromide as soon as the aura is noted. In very many cases in which an immediate cessation of fits followed the exhibition of bromide its effect wears off, and the fits gradually begin to recur, and then a change of bromide will sometimes again cause a cessation of fits. He finds little difference in the two salts he has used principally, viz., strontium and potassium, except that from 1/2 to 2/3 dose of the potassium seems to have the same effect as the larger dose of strontium.

Calcium salt he has never tried. Littlejohn, at Hanwell, reported success, but Mann, writing in the *Guy's Hospital Gazette,* found it useless, and Lallment and Dupony, at the Asylum at St. Yon, in fourteen cases had one death, no benefit, and in many cases so bad an effect that the treatment had to be abandoned.

Opium the author is finding useful in two cases which are intolerant of bromide. But he has not yet been able to complete the treatment by heavy dosing of bromide afterward, so can express little opinion about it.

Digitalis he found very useful in a case which had a very large number of fits, and in which something like an 80 per cent reduction occurred, but in several other cases he has found it quite useless.

To sum up, the writer thinks that for the confirmed epileptic, colony life, a reasonable diet, and interesting employment in the open air, if possible, are the most satisfactory methods we have at present. Bro-

mides should not be given unless excess of fits, malaise, or excitement absolutely demands it. In the latter case bromides sometimes make colony life a possibility. He states he cannot help feeling that some epileptic dementia is bromide dementia, and not epileptic in reality.

In conclusion, he records the interesting case of an ex-soldier, aged twenty-eight, who has true nocturnal fits, after which he is violent and wandering for some twenty minutes or so; in the daytime he has attacks of minor epilepsy, in which he rushes forward as fast as he can go, striking out at everything in his way, smashing windows, etc., and struggling violently. His attacks may be often prevented by shouting his name in his ear the moment he shows the preliminary pallor. Syphilis is denied in this case. Fits began at twenty-six, after a kick on the head by a horse.

TREATMENT OF DIABETES MELLITUS.

In the *Journal of the American Medical Association* of October 7, 1911, HODGSON says that the following are the objective points in treatment:

1. To free as nearly as possible the blood and other tissues from sugar; to do this it is necessary—

2. To find the individual patient's tolerance for carbohydrate and if possible to increase that tolerance.

3. To find a diet that will furnish the necessary calories without at the same time increasing the sugar intake.

4. To prevent, by dietetic or other measures, the constipation with which the majority of these patients suffer and which increases the toxemic condition.

The first thing to impress on the patient is the fact that this disease—in the class of cases under consideration—is one that possibly has been years in developing, and that it is useless and hopeless for him to expect to obtain any relief in a short time. The changes which a long-outraged system has undergone are such as cannot be remedied in a week or a month. In diabetes, more than in almost any other disease (unless it is tuberculosis), the help and coöperation of the patient is absolutely essential to successful treatment.

Another fact to be emphasized is the futility of drugs in the treatment of this disease—futile, because harmful habits cannot be cured by drugs. A large percentage of the patients who present themselves bring with them their bottles of codeine. It is an unfortunate fact that many physicians still seem to harbor the belief that arsenic possesses virtues not to be found in the official preparations, and, moreover, that it has lost the dangerous qualities inherent in it. The author states he has seen so many patients with the codeine habit and aggravated cases of constipation superimposed on the diabetes, and so many with wrecked digestive systems due to the long-continued use of arsenic solutions, that he utters a word of warning against the employment of these drugs.

Codeine and arsenic may have their uses in a limited number of cases, but in the great majority they should be left severely alone. If these drugs were merely worthless, there might not be any serious objections to their use, but they are a positive detriment, and their continued use lessens the patient's chances of recovery. Not only that, but whenever a drug is given to a diabetic he is usually less careful in his method of living than if he realizes that his recovery depends on diet and hygiene alone.

FRENCH COMMISSION ON ANTITYPHOID VACCINATION.

The *Boston Medical and Surgical Journal* of October 19, 1911, has this to say concerning this important subject, quoting from the report of the Commission of the French Academy of Medicine:

First: Antityphoid vaccination for several years has been applied with success in the English, German, and American armies. More than 100,000 persons have been inoculated either in their native country or especially in colonies where these soldiers were sent and where typhoid fever is prevalent.

Second: The benefits conferred by these preventive inoculations are revealed by comparative statistics of the typhoid morbidity and mortality, on the one hand, among soldiers subjected to the vaccinations, and, on the other hand, among the non-vaccinated. The former have presented a case incidence of typhoid fever of at least one-half that of the latter.

Third: Antityphoid vaccination does not accomplish the complete disappearance of this infectious disease in the communities where it is practiced, but it diminishes very notably its frequency. Moreover, such of the vaccinated who contract typhoid fever notwithstanding have much milder attacks than non-vaccinated subjects. The percentage of deaths supervening among the former is one-half that of the non-vaccinated typhoid patients.

Fourth: A single inoculation of bacillary vaccine assures a less efficacious protection than two or three inoculations. For vaccination by autolysates of living bacteria, four injections are made.

Fifth: Relative or complete, the immunity engendered by antityphoid vaccination appears to last from one year (Pfeiffer-Kolle vaccine) to four years (Wright's vaccine). It is therefore advantageous, if it is desired to prolong this period of immunity, to have recourse to revaccination.

Sixth: No matter which vaccine is used, antityphoid vaccination has shown itself to be without danger for the very numerous persons who have been inoculated. It appears that injections of vaccine of dead bacilli, while harmless in themselves, give rise to fever as well as painful local and general symptoms. These disappear in from twenty-four to forty-eight hours. The proposition has been made to employ the autolysate of living bacilli as an antigen. This vaccine is much better borne and causes little pain or none at all.

Seventh: As a precautionary measure, vaccinal inoculations should never be made during an epidemic nor in persons who certainly have been exposed within less than three weeks to the contagion of typhoid fever. Preventive vaccination, therefore, should generally be undertaken before the usual time of the appearance of epidemics in localities and communities where they are habitually observed.

Eighth: For the same reason (that vaccination may cause a temporary predisposition to infection), and during the period immediately following inoculation, every person vaccinated against typhoid fever should take the strictest precautions to avoid the chances of typhoid infection by a careful watch upon the water that is drunk and the food that is eaten, as well as by rigorous personal hygiene and cleanliness. The period during which such precautions must be taken has a duration of two or three weeks at the most.

Ninth: In the army and navy, antityphoid vaccination is destined to render real service, more particularly in Algeria and Tunis, as well as in the colonies where typhoid fever is frequent and severe. When there are no cases of typhoid fever and no danger of an epidemic at the place of destination of soldiers and sailors, the inoculations may be undertaken upon their arrival. In the contrary event, the inoculations should precede by at least three weeks the arrival of these young men in the colonies where the disease exists in endemic form.

Tenth: No subject should be vaccinated in whom typhoid seems imminent or at the beginning of an attack, as vaccination may aggravate the disease. It should be practiced only upon perfectly healthy subjects, free from all organic or other defects and from local or general affections, no matter what their nature, especially in tuberculosis.

As a result of examination of these and other data, the commission reached the following conclusions, which were unanimously adopted:

There are grounds for recommending the voluntary employment of antityphoid vaccination as a rational and practical method of diminishing, by a sensible proportion, the frequency and gravity of typhoid fever in France and in the French colonies.

This recommendation is addressed to all whose profession, whose usual or accidental

methods of alimentation, whose daily or frequent association with the sick or with bacillus carriers, expose them to direct or indirect contagion by the bacillus of typhoid fever.

The groups of persons designated as likely to be particularly benefited by anti-typhoid inoculations are:

(*a*) Physicians, internes, medical students, male and female nurses in military and civil hospitals.

(*b*) Members of families in which bacillus carriers have been demonstrated.

(*c*) Young persons of both sexes who have come from salubrious regions in the country to cities which are habitual foci of typhoid fever.

(*d*) The population of cities where the latter disease is frequent.

(*e*) Soldiers and sailors (rank and file) sent to colonies where typhoid fever is epidemic or endemic.

REGULATION OF BLOOD-PRESSURE AND CARBON HYDRATE METABOLISM BY MEANS OF THE CHROMAFFINE SYSTEM.

FALTA and PRIESTLEY, in the *Berliner medicinische Wochenschrift* of November 20, 1911, remind us that it has long been the belief that the chromaffine system has an important physiological and pathological significance.

Porges found that after extirpation of the suprarenal glands in a dog, the sugar content of the blood is reduced rapidly, and the blood-pressure sinks slowly. Schur and Weisel have tried to explain the excessive tension in the contracted kidney as due to an increased production of adrenalin. It is doubtless true that there are cases of contracted kidney the blood-serum of which does not give the familiar Meltzer-Ehrman reaction. They have carried out a number of experiments, the results of which have led them to believe that one is not justified in attributing the contracting effects of blood-serum upon living sympathetically innervated organs to the presence of adrenalin. So far all experiments on man have been done with venous blood, but it is a question whether the peripheral veins contain adrenalin. The individual vessel areas react in a very different manner upon the injection of adrenalin into the jugular or femoral vein. The blood-vessels of the intestines, skin, and striated muscles contract vigorously, while those of the lung and brain dilate. The vessels of the kidney at first contract and then dilate. Some investigators think the dilating effect is due to the irritation of the vasodilators; others to the vigorous contraction of the highly innervated muscle fiber in the organ, which forces the blood into such organs as the lungs and brain which have poor sympathetic innervation. It is also a fact that upon running an adrenalin solution through the intestines, a large quantity of the adrenalin contained in the solution disappears, while in running through the lungs it retains nearly all of its original value of adrenalin.

The different reaction of the individual vessel areas to the contracting powers of the adrenalin can be beautifully shown by injecting adrenalin into different areas of veins, and then taking the pressure from the femoral artery. The authors carried out a number of experiments on dogs, by giving small doses and injecting them rapidly. The dogs were kept slightly under ether and the blood-pressure taken from the femoral artery. It was found that in the territory of the femoral artery, small, and sometimes even large, quantities of adrenalin were absorbed. In the brain the adrenalin was not retained. In the abdominal arteries a very marked retention of adrenalin took place; in the region of the portal vein a very small amount is absorbed. After the injection of the splenic vein a perfect retention took place. They also found that pituitrin seems to act like adrenalin. Thus it must be noted that the adrenalin is rendered physiologically inactive to a high degree in those vessel areas which retain it, and the minimal doses of adrenalin which go into the blood under physiological conditions are rendered physiologically inactive when passing through the capillary system. Hence, wherever the

adrenalin acts, it must either be used up or otherwise changed. Falta and Priestley conclude then that the venous blood which comes from the highly sympathetically innervated organs under physiological conditions must be free from or at least contain less adrenalin than the arterial blood going to those organs.

They discuss also the importance of the results as to the bearing upon the regulation of blood-pressure and blood distribution. They have found in animal experiments that after injecting large quantities of adrenalin subcutaneously and then opening the chest after a period of one or two hours and tying the larger blood-vessels, they were able to keep blood distribution intact. In all of these experiments they found that the muscles, skin, intestines, mucous membrane, and spleen were pale, while the lungs, liver, and sometimes the kidneys were overfilled with blood, so much so that upon incision dark-colored blood escaped. In the lungs hemorrhages were not infrequent and the right heart as well as the whole venous system was greatly distended.

The way in which the influence of the chromaffine system acts upon the regulation of blood-pressure and blood distribution seems to be shown by these experiments. Through the long lasting absorption of adrenalin by the blood, a certain tonus in the large vessel areas of muscle, skin, intestines, etc., is acquired, and therefore a certain blood distribution is obtained which is regulated by impulses from the medullary nervous centers. It is also probable that the life-prolonging power of the chromaffine system is subject to rapid changes, which may be produced by an overstimulation of impulses. It is known that the function of the chromaffine system is regulated by the sympathetic nerves. The effect of the diabetic puncture is explained by an irritation of the chromaffine system in that from the center of the diabetic puncture impulses travel to the suprarenals, which cause a sudden discharge of the adrenal secretion, and therefore produce glycosuria. It can also be shown that by severing the connection between the medullary centers and the abdominal organs the sugar contained in the blood sinks rapidly until it only shows slight traces. In their experiments they found that the decrease in blood-pressure could only be explained by paralysis of the vasomotor nerves in the abdominal organs and the rapid falling of the sugar in the blood to the absence of suprarenal activity. In the liver, which receives adrenalin containing blood through the hepatic arteries, the much larger quantity of blood flowing through the portal vein is free of adrenalin. They find from their experiments that the sugar appearing in the blood after the injection of adrenalin originates largely in the liver. The muscle glycogen, therefore, hardly comes in for consideration in the maintenance of the blood-sugar index.

By means of the constant function of the chromaffine system we tend to produce a certain distribution of blood, which supplies a sufficient amount of blood to the vital organs while the activity of the heart is at its minimum. Changes in the blood distribution, as caused by sudden impulses, can be regulated by the nervous system, but the authors believe it possible that every function, coming with an increase of metabolism, also leads to an increase in the function of the chromaffine system.

It now remains to consider the above views on the importance of the chromaffine system in the regulation of blood-pressure and carbohydrate metabolism upon pathological conditions. In cardiac defects, which appear with a hypertrophy of the left ventricle, we find not infrequently increased blood-pressure in the peripheral arteries. Also with a failure of compensation there follows a swelling of the liver, and it has also been found that in cases of hypertrophy of the left ventricle a hypertrophy in the chromaffine system follows, so that we may take it that the increased function of this system is compensatory. It is known that as a consequence of this the liver, kidneys, and brain are overfilled with blood, and that upon failure of compensation the liver swells up comparatively early. The

same condition is found in those individuals suffering from heart insufficiency due to arteriosclerosis. In mechanical obstruction of the right heart Ischer found a volume increase of liver and brain, so that probably the increase in blood-pressure in the venous system results in a reflex irritation of the entire sympathetic system, and so has an effect upon blood-pressure similar to that produced by adrenalin injection. An abnormal function of the chromaffine system must also have an influence upon the regulation of carbohydrate metabolism. The deposition of carbohydrates in the liver probably is governed by this system, whereas the production is probably regulated by the pancreas, and thereby the relations of the function of the chromaffine system to certain forms of glycosuria are possibly explained.

PITUITRIN IN OBSTETRICS.

In his inaugural dissertation on "The Importance of Pituitrin in Obstetrics," ROBERT CAHN, a candidate for the doctorate of the University of Freiburg, Germany, after reviewing the literature on the subject *in extenso,* makes the following report concerning the use of pituitrin in the Freiburg clinic: As a styptic he employed pituitrin eight times in cases of postpartum hemorrhage. The bleeding was promptly checked in seven instances, and it was noticed that the hemostatic action was exerted more rapidly than is the case with ergot preparations.

As an ecbolic agent he employed pituitrin in 87 cases. The injection was made subcutaneously in the gluteal region. When the first injection proved insufficient another was made after the lapse of two hours, and, in case of necessity, a third. Generally only one cubic centimeter was administered. Less than that did not prove effective.

In 83 of these cases the labor pains were inefficient in the first and second stages of labor. Among these it was possible to produce a prompt effect that led to spontaneous delivery in 55 cases. The labor pains generally set in within five minutes, returned at intervals of from two to four minutes, and lasted from three-fourths of a minute to two minutes. In nine additional cases two injections of one cubic centimeter were required to produce spontaneous expulsion; in three instances three injections of one cubic centimeter had to be made in order to terminate labor; and in six cases recourse had to be had to forceps delivery because labor progressed too slowly.

In ten cases of uterine inertia the agent proved either totally ineffective or produced only insufficient labor pains. The reason for these failures cannot be given with certainty. Incidentally it should be stated that the injections were not made under the precautions outlined by Hofbauer. According to these the syringes should not be cleaned with alcohol but with a sterilized solution of sodium chloride. Since this precaution has been observed at this clinic, the effect of the injections has been more prompt and the number of failures smaller.

In seven of the ten cases of failure there were slight labor pains, so that it would be incorrect to speak of a total failure. It is even more than likely that a pronounced action would have been produced if another injection had been made. Why this was not done is not apparent. There were, however, three cases in which the administration of pituitrin proved wholly ineffective.

In addition to the 83 cases of uterine inertia, pituitrin was employed as an ecbolic agent in four cases in which it was desirable to accelerate the process of labor. In two of these cases there was an impairment of the fetal heart sounds. As these grew steadily worse, however, it was impossible to wait for the effect of the pronounced labor pains that set in, and the birth had to be terminated by means of the forceps.

Pituitrin also proved successful in two cases of placenta previa.

Cahn summarizes the indications for pituitrin as follows: It is the best ecbolic agent we possess, especially in the first and second stages of labor. One injection of

one cubic centimeter is generally sufficient to terminate the labor spontaneously.

Whenever it is necessary to accelerate the act of expulsion, after labor has begun (on account of a high fetal heart-rate, elevation of the mother's temperature, etc.), pituitrin generally does the work quickly and thus obviates a recourse to the forceps.

Pituitrin is not serviceable for the induction of a premature birth in the early months of pregnancy.

Pituitrin is a reliable styptic for the treatment of hemorrhage due to uterine inertia. This renders it particularly valuable for the prevention of secondary hemorrhage after a cervical Cæsarian section.

In the disorders of the placental period, pituitrin has also proved of service. It commends itself therefore whenever there is a delay in the delivery of the placenta after cervical Cæsarian section.

On account of its tonic effect upon the bladder, pituitrin has proved to be a useful remedy in the ischuria paradoxa of the parturient.

FATALITIES FOLLOWING THE INTRAVENOUS INJECTION OF SALVARSAN.

The earlier fatalities which followed the use of salvarsan were attributed by Ehrlich to the presence of advanced disease of the nervous or cardiovascular system, which he stated were contraindications to its administration. He claimed that with due care salvarsan was perfectly safe. Unfortunately, several fatalities have been recently recorded, and show that its administration, even in young and robust patients, is by no means devoid of risk. In an annotation are described two American cases in which acute nephritis was produced in young men by an intravenous injection of 0.6 gramme. In one case fatal anuria supervened. The patient at the time of the injection had a characteristic secondary rash, and his urine contained a trace of albumin, but no casts. Previously to acquiring syphilis he enjoyed uninterrupted health. In the other case the urine was perfectly normal, but after the injection the patient presented all the signs of acute nephritis. In another annotation reference is made to the case of a robust man, aged thirty-five years, reported to the Académie de Médecine of Paris by M. Hallopeau. For a relapsing palmar and plantar syphilide the patient was given by a practitioner an intravenous injection of 0.3 gramme of salvarsan, which was well borne, and on the sixth day an injection of 0.4 gramme. Congestion of the face, vomiting, and epileptiform convulsions followed, and he died comatose.

Professor Gaucher declared that several deaths had followed the use of salvarsan at the Saint-Louis Hospital, and that almost all the patients died in the same manner, with epileptiform convulsions. In the *Medical Review* for December five cases of this kind are collected from German sources. Four proved fatal, and the necropsy showed the same condition in all—hemorrhagic encephalitis. One recorded by Prof. B. Fischer may be taken as an example. A healthy physician, aged forty years, in the course of his professional work contracted a chancre on the septum nasi. There was a maculopapular eruption. On March 28, 1911, 0.4 gramme of salvarsan was injected intravenously. A slight rigor and several attacks of vomiting followed. In a few days the eruption faded and the primary sore rapidly healed. As a prophylactic against relapses he underwent a course of mercurial inunctions. Five days after its completion (on May 6) 0.4 gramme of salvarsan was given intravenously. This was at first well borne, and after a day's rest in bed the physician saw his patients, but during the night he became ill, and on the following morning was found by Professor Fischer partially conscious. When roused he tried to answer questions, but with little success. There was constant movement of the upper part of the body. In the afternoon a fit of excitement, coma, and Cheyne-Stokes respiration supervened, and in the evening there was opisthotonos. The temperature rose to 104° F., and death occurred at 5.15 A.M. on the following morning. The necropsy showed general

parenchymatous degeneration of the organs and a fatty liver. The brain was diffluent, and there was slight chronic leptomeningitis of the parietal and frontal regions. The pial vessels were distended. Microscopically, numerous punctiform hemorrhages were seen around the minute vessels of the basal ganglia and polynuclear leucocytes distending the perivascular spaces (hemorrhagic encephalitis).

A German case of fatal jaundice after the administration of salvarsan is also reported. Jaundice has been noted in several cases of the administration of the drug. At a meeting of the Royal Academy of Medicine in Ireland on November 3, Mr. H. Moore reported a case in which 0.5 gramme of salvarsan was injected intravenously in an early case of general paralysis in a man aged twenty-five years. A severe reaction with rise of temperature to 103° followed. Six weeks later the injection was repeated, and still severer reaction and death with paralytic symptoms followed. It is curious that most of the deaths have followed a second injection. This has led Professor Fischer to suggest that anaphylaxis may play a part. The point is important in connection with the recent claim of some of the advocates of salvarsan that two injections are necessary to cure syphilis.—*Lancet,* Dec. 23, 1911.

DIAGNOSIS AND MEDICAL TREATMENT OF POLIOMYELITIS.

The *Pennsylvania Medical Journal* for December, 1911, contains an article by SPILLER on this subject. He reminds us that as the possibility of infection through the nasal mucous membrane has been demonstrated experimentally by inhalation of an emulsion of an infected spinal cord, and by rubbing it into the nasal mucous membrane, it is well to disinfect the nasal mucous membrane so far as possible by some antiseptic mouth-wash and spray. Hydrogen peroxide or menthol is valuable for nasal disinfection. There is much reason to believe the disease may be transmitted by healthy carriers, and disinfection of the nasopharyngeal passage of persons exposed to the disease is desirable. It is questionable at present whether either food or insects communicate the infection. Breast-fed babies in some epidemics have been chiefly affected.

Recovery is not to be despaired of, even when the paralysis has been pronounced. The affected children should be isolated, and other children of the family should be kept from school for at least three weeks. The room, the clothing worn by the patient, and the bedding used should be disinfected. Rest at the onset of the disease is desirable. There is a possibility that some cases may be arrested in the abortive stage by rest. Excessive exertion at this time possibly may bring on a paralysis that might have been avoided. Pain may be treated by antineuralgic remedies, but these may fail to relieve severe pain. The writer has known lumbar puncture to give great relief under such circumstances. Hot baths for ten or fifteen minutes every four hours, three or four times daily, have been found to lessen pain and produce sleep. Suppositories of opium with extract of belladonna may be useful.

Hexamethylenamin (urotropin) may have some effect in disinfecting the spinal fluid, but if long continued there is a possibility that the formaldehyde set free may have a hardening effect upon the spinal cord. Two grains may be given every two hours during the first two or three days. The drug seems to have an inhibitory action rather than a curative. Calomel is a useful early remedy when constipation is present, and may be combined with soda. It may have some disinfectant action on the bowels, by which poison is supposed to find one of its means of entrance to the system. Castor oil also is useful.

Pneumonia and bronchitis are to be feared in some cases, and exposure to draught is to be avoided. The danger is increased by paralysis of the respiratory muscles.

Diaphoresis is desirable, and may be obtained by means of hot drinks, packing, and hot air. Some simple remedy, as citrate of

potassium, is useful for its action on the kidneys.

The tendency to contracture by faulty position and weight of the bedclothing must be avoided. Electricity may be employed after three or four weeks, and where muscles do not respond to the faradic current, the galvanic should be employed. The electricity should only be given by some one familiar with its use. Active movements may be made against resistance to the hand of another person, and attempted movements may be assisted by the electric current.

The serum treatment, according to Flexner, is in the experimental stage, and it cannot be predicted how soon or whether at all such a form of specific treatment of the disease will be applicable to the spontaneous epidemic disease in man.

OPEN ETHYL CHLORIDE ANESTHESIA FOR MINOR OPERATIONS AND AS PRELIMINARY TO OPEN ANESTHESIA.

The *Australasian Medical Gazette* of November 20, 1911, contains an article on this topic by HORNABROOK, who says that in the open method of ethyl chloride administration the drug enters the system gradually and with free admixture of air, the shock given is more in the nature of a gentle push into unconsciousness as against the more violent and rapid rush into a state of insensibility in the closed method, and with the open method there is no feeling of suffocation or desire to fight for air. It has been noticeable that there is very seldom any headache or feeling of great fulness in the head after the open method, both of which conditions are common after the closed. Ethyl chloride is very rapidly eliminated from the system, so that a few minutes after the completion of the operation the patient is quite fit to go home, a big advantage from the patient's standpoint as against ether or chloroform. Vomiting is rare unless the patient has swallowed some blood, in which case it will be brought up, but the feeling of sickness soon passes away. In the previous sentence the author wrote "swallowed" some blood, and this is very noticeable in dealing with open ethyl chloride, that the swallowing and coughing reflexes are retained, a big point when dealing with postnasal and tonsillotomy cases, and also with dental extractions, for here, if any blood gets into the back of the throat, it is swallowed, or trickles into the larynx, and a cough is at once set up, so that the fragment of postnasal growth or other foreign body is thrown up. On numerous occasions, after the extraction of a number of teeth, the patient has been allowed to come to sitting up in the dental chair, and not putting his head over the spittoon—directly the blood gets to the back of the throat a reflex cough has been set up, as one so often experiences when a small pellet of phlegm tickles the throat.

Given the advantages of open ethyl chloride, what are its disadvantages. One is, it is a slightly more expensive method of administering the drug, 8 to 10 Cc. being used in the majority of cases as against 3 to 5 Cc. by the closed method. A No. 70 tube of kelene graduated to 50 Cc. should do for six or seven administrations. Another disadvantage is that in the cold weather especially a patient is occasionally met who is difficult to put deeply under the drug. He will go to a certain stage, but on attempting to extract teeth, his hand will be raised or he will make some movement that interferes with the operator. The class of case in which this may occur is that of the full-blooded male; the fault does not, however, rest entirely with the drug, but may be due to the ethyl chloride being sprayed too much on to one spot and not over a fairly wide area, which increases the evaporation. In the majority of cases in which the administrator meets with incomplete success, the fault lies in some failure of technique. A good method of administration in cases of this sort is to put the patient off with open ethyl chloride and then to deepen the anesthesia with closed somnoform. By this means the struggling stage which may be met with is generally avoided.

The length of time that a patient remains

quiet after being anesthetized by open ethyl chloride is from one to one and a half minutes, such as is the case with dental extractions and removal of adenoids. Open ethyl chloride can, however, be administered for a longer operation, such as removal of aural polypi, or setting a fractured limb. The author asserts he has had a patient under for twenty minutes by the open method, but does not recommend it for cases of more than five or ten minutes' duration, as it would be very expensive and has no advantage over open ether when prolonged anesthesia is required.

What are the advantages of open ethyl chloride as against somnoform by the closed method? First, he thinks it is certainly much safer. In the whole of his experience of open ethyl chloride, either by itself or as a preliminary to open ether anesthesia—that is, in nearly 3500 cases of all ages, both sexes, and nearly every major or minor operation—he asserts he has not once had a moment's anxiety or had to resort to any artificial means of respiration. He thinks this fact is mainly due to absence of sudden concentration by the open method, and the feeling in the patient's mind that there is nothing to struggle against—he knows that he will not be suffocated, but will get air the whole time. In dealing with plethoric men he certainly thinks it is easier to put them under with somnoform entirely, or to follow the open ethyl chloride by closed somnoform—this is especially the case in the cold atmosphere of winter. If you start with somnoform by the closed method, do not rush it, but bring the mask gradually closer to the patient's face; no good is ever done by rushing the anesthetic, even with nitrous oxide administration—the air supply ought to be cut off gradually, if necessary.

Ethyl chloride is certainly a more pleasant drug for the patient than somnoform, though the present formula contains 83 per cent chloride of ethyl as against 65 per cent in the original. The sensation of floating off into unconsciousness by means of open ethyl chloride is a most delightful one, especially if the administrator does not try to rush the drug at the start. With open ethyl chloride the conjunctival reflex is lost early; this is followed by the breathing of the patient becoming of a stertorous or snoring character, especially if the mouth has not been gagged wide open. When the breathing takes on this vibratory character, which is generally within one and a half or two minutes from the very commencement of administration, the patient is ready for operation of short duration, such as the extraction of two or three teeth, opening of an abscess, or removal of adenoids by an expert operator. The whole of this time the corneal reflex is well marked. Should the administrator wish to deepen the anesthesia, he may continue the administration for ten or a dozen breaths after the vibratory character of the breathing has commenced; by this means the patient remains a short time longer under the influence of the drug and more time is given the operator, but even in these cases the corneal reflex is not lost except in rare instances. In fact, with open ethyl chloride, one of its great charms and points of safety lies in the fact that the corneal, swallowing, and coughing reflexes are retained.

1. For minor operations of short duration, where open ethyl chloride is employed by itself, the best material to use is honeycomb toweling of medium thickness, and of one layer only.

2. For prolonged operations when open ethyl chloride is followed by open ether, use a mask covered with one layer of flannel of medium thickness, two layers of domette, or eight layers of white gauze.

3. In the open ether anesthesia that has been preceded by open ethyl chloride, bridge over the stage between the two with a few drops of chloroform.

4. Lint, as a material for covering mask, is strongly objected to by the writer, owing to the thickness of the material, and the vapor of condensation forming on the inner layer of mask and the danger of shutting in a 2-per-cent or more of chloroform vapor, even when only a little chloroform has been dropped on at a time.

5. The best make of ethyl chloride to use

is that known as kelene, not that the ethyl chloride is better than other makes, but the preparation is put up in 50-Cc. bottles, with a patent stopper which makes it very easy to handle. Kelene has also a pleasant odor which some of the other preparations have not.

6. In using kelene from the No. 70 bottle containing 50 Cc., be careful not to spray any of it into the patient's eyes, as it is very painful.

7. In order to get a free drop and prevent spraying, insert a very small piece of cotton-wool under the stopper—it will then be found that on gently elevating the lever the kelene will drop freely.

8. Do not forget to remove cotton-wool after each administration, or you will lose a large amount of kelene by leakage or evaporation.

9. A No. 70 bottle of kelene ought to do for six or eight administrations.

10. Don't rush your ethyl chloride at the start; place only about 15 drops on the mask or towel and let the patient get accustomed to the smell; rushing the drug will only make your patient gasp and have a somewhat catchy sensation in the throat.

11. After about a quarter of a minute, drop more ethyl chloride on the mask, increasing the size of the moistened area to about two inches in diameter, and then in another fifteen seconds or so to an area about the size of palm of hand.

12. The secret of good anesthesia, with free relaxation, is that of ethyl chloride vapor with free air mixture; if the drug is too concentrated on the patient, rigidity may arise.

13. Rigidity in a patient does not mean, as a rule, that the patient is not anesthetized, but that the drug, whether nitrous oxide, ethyl chloride, or ether, has been too concentrated on the patient without free admixture with air.

14. Surgeons, when operating, should remember that all anesthetics are poisons, and therefore continue steadily at work so as to get the patient off the operating-table as early as possible, without, however, sacrificing skill for speed.

15. Don't tell yarns to students during operation, even if they do bear on the point; a yarn can generally stand over with benefit to the patient.

16. Don't try to remove an abdominal tumor as big as your head through a four-inch incision; it only means bruising the walls of the incision and the necessity for the anesthetist to keep the patient for an extra quarter or half-hour under a poisonous vapor which cannot possibly be of benefit and certainly increases the likelihood of postoperative vomiting and tension on the wounded area.

17. In all cases over twelve years of age in which open ethyl chloride is followed by open ether, the writer uses as a routine ⅛ grain morphine and 1/150 atropine, given from three-quarters to one hour before operation.

18. One-eighth grain morphine and 1/150 atropine act as well as the ¼ or 1/6 grain morphine and 1/100 or 1/120 grain atropine generally given, and also have the advantage that the reaction of the iris is not entirely masked by the morphine.

19. The reason for giving the hypodermic from three-quarters to one hour before operation is to allow time for the morphine to pass over its stimulating stage and reach the sedative period.

20. The morphine places the patient on the table in a calmer frame of mind than if none had been given, and the atropine, by inhibiting the vagus, acts beneficially, also lessens the secretion in the air passages and diminishes the likelihood of profuse perspiration.

21. The morphine and atropine, as above, are given in all cases, the presence of albumin in any quantity in the urine making no difference to counter-ordering it.

22. The only disadvantage of the preliminary of ⅛ grain morphine and 1/150 atropine is that in some cases the patient passes into a quiet morphine sleep, and when the surgeon makes his skin incision there may be movement of the patient.

23. In using open ethyl chloride for minor operations, always remember to tell your patient to empty his bladder before getting on to the operating-table.

24. The free administration of air with an anesthetic is quite as essential for the welfare of the patient during the stage of anesthesia as it is for the efficient running of your motor.

25. To put a patient under profound anesthesia with dilated immobile pupil, loss of corneal reflex, and complexion of a purplish-white hue is not good anesthesia.

26. The primary duty of the anesthetist is toward his patient; by carrying out that duty efficiently he fulfils his duty to the surgeon by maintaining the patient in the best condition during operation and on completion of it, so that the patient is placed in the most favorable condition for rapid return to health.

27. Rigidity in a patient under an anesthetic does not of necessity mean that he is not fully anesthetiezd; it may, and very often does, mean that he is asphyxiated from concentration of the anesthetic, such as ether vapor, nitrous oxide, ethyl chloride, or any other vapor not allowing free air supply to the lungs.

THE USE OF CHROMOSANTONIN IN THE TREATMENT OF INTESTINAL AFFECTIONS OF THE TROPICS.

BEGG and MAXWELL in the *China Medical Journal* for November, 1911, tell us that in the Medical Reports of the Chinese Maritime Customs for 1887 Begg published an account of cases of chronic diarrhea cured by the administration of santonin, and from time to time followed that paper up by others in various journals. Further experience made it clear that white or purified santonin was practically useless, and that the virtue of the drug lay in some change brought about by exposure to sunlight, or in some similar way. And it is well that this should be clearly borne in mind, as both authors have seen failures due to its being completely disregarded. Another point which should be borne in mind is that the chromosantonin is more efficient when administered in olive oil. For some reason not fully clear, it is not so efficacious when administered by itself; and in some cases, possibly due to rapidity of elimination, may fail of the desired result.

In this paper the action of the drug as a vermifuge or vermicide is deliberately excluded. It is true that one may meet with chronic diarrhea due to the presence of the roundworm, and that these cases are at once amenable to santonin treatment, but the chronic tropical diarrhea which this paper discusses is a more serious matter. In its most common form it is called "sprue." Other cases simulate dysentery very closely, even if they be not caused by the known agents, the Shiga bacillus or the amœba histolytica; and a further group are characterized by chronic diarrhea of the sprue type but unaccompanied by any mouth symptoms whatever.

For the sake of clearness the authors divide their material into the consideration of:

1. The nature of the drug.
2. Its use in "sprue."
3. Its use in dysentery.
4. Its use in unclassified diarrheas.
5. The best method of administration, with hints on diet, etc.
6. A warning on the necessity of careful diagnosis and the treatment of complications.

Santonin is a neutral crystalline principle extracted from the unexpanded flower heads of *Artemisia maritima*. Probably, however, it is not truly neutral, but the anhydride of monobasic santonic acid, and its formula $C_{15}H_{20}O_4$.

Its general characteristics are well known and need not be discussed here. Suffice it to say that we have to deal with two substances, both of which pass under the name of santonin.

The first is ordinary white santonin, which has been tried in the treatment of the affections which are here discussed, and found to be useless or practically so.

The second is yellow santonin (chromosantonin of Montemartini). It is prepared by exposing ordinary santonin to sunlight over a considerable period, and that the yellow color is not a mere color change is proved by the following points:

"There is no change in weight, but the derivatives are different, the rotary powers are different, and the color is different." If the yellow santonin be dissolved in alcohol, and repeatedly recrystallized, it gradually passes back again into the white.

Chromosantonin is more readily oxidized, and the products of oxidation are said by Montemartini to be different. Sestini says that the white santonin is changed into formic acid, an uncrystallizable substance much more soluble in alcohol and ether than santonin (photo-santonic acid $C_{15}H_{22}O_5$), and a red resinous substance.

Both the white and the yellow undergo oxidation in the tissues, and are excreted in the feces and urine in several forms, two certainly oxysantonins (Jaffe).

But little, however, is known of the process of oxidation. Under ordinary circumstances probably little is dissolved in the stomach. It may, however, in rare cases, be so rapidly absorbed as to be useless for the purpose of a vermifuge. The major part of the drug is absorbed from the intestine, and undoubtedly passes into the blood stream, as in large doses there is a marked influence on the cerebrum. It is certainly excreted by the kidneys, and possibly is reëxcreted into the intestine. On the urinary passages it has some irritative action, and it may cause incontinence in children, and clinically in adults it may act as a diuretic, though Cushny denies that there is any true diuretic action.

In large doses vision is markedly affected —first in the direction of bluish vision, followed by yellow vision, wherein everything white appears to be yellow; then there may be hallucinations of vision and confusion of speech, the sense of taste and smell may be deranged, and, in rare instances, hearing likewise. As the effect of the drug passes off, there may be a period of violet vision.

All these effects may supervene on a medicinal dose.

Poisonous doses are not considered, and it may be merely noted that there is a very marked cerebral disturbance in these cases.

The preparation of chromosantonin is not an easy matter. To get a really good specimen may need six months of sun in subtropical regions, and white santonin with a slight yellow tint is *not* chromosantonin, though it has, as already said, been used as such, with consequent disappointment at the failure to get the expected result.

PUTREFACTION TOXEMIA OF INTESTINAL ORIGIN.

CORNWALL in the *Medical Record* of December 23, 1911, tells us that the diagnosis of chronic putrefaction toxemia of pathological degree, and its identification, as the cause or aggravator of existing morbid conditions in any particular case, can usually be made by clinical means alone, and particularly by the therapeutic method. The therapeutic method of diagnosis consists in giving an antiputrefactive diet in any suspected case and watching results. If recovery or great improvement follows, especially when in this particular case or similar ones treatment by drugs or other agencies has failed to produce such favorable results, the diagnosis is confirmed with a reasonable certainty. This therapeutic method of diagnosis has the advantages of facility of application and absolute safety, and it is on the whole more satisfactory than any of the laboratory methods now at our command; even the most exact of the laboratory methods, which consist in finding the toxic coefficient of the patient's blood, or the aromatic coefficient of his urine, can only give an index to the absolute quantity of toxic substances present, and tell nothing of the relation of this absolute quantity to the tissue resistance of the patient, which is the essential fact in the diagnosis.

The practical question here arises, What constitutes an effective antiputrefactive diet? In the case reports already presented the author has suggested in outline the antiputrefactive diet which he uses with his own patients. That diet is extremely simple and easy to prepare, and it has proved successful. Other diets equally effective can no doubt be devised without difficulty, provided the essential requirements of an antiputrefactive diet are satisfied. The es-

sential requirements of such a diet are: To reduce the putrefiable protein ingested to a rational minimum—that is, to a minimum which fits the particular case; to keep the contents of the intestinal tract acid throughout; to diminish greatly the amount of cane-sugar in the diet or to eliminate it altogether; to be sufficiently laxative to insure a bowel movement once daily, and to restrict the total quantity of food to the needs of the body. The first requirement is met by reducing to a very moderate amount, or to zero, all protein in the diet which is of animal origin except milk, which is not ordinarily putrefiable because it is protected by its lactacidifiable carbohydrate. The second is met by including abundant milk and cereals in the diet; and if in addition to the lactacid bacilli normally present, we artificially colonize the intestines with extra quantities of those bacilli introduced with the milk or otherwise, the acidification of the bowel contents is greatly facilitated: the cereals supply sugar in the lower part of the intestine, out of which those bacilli can make lactic acid, which is the great acidifier of the bowel contents and our most direct antiputrefactive agent. The third requirement, to cut out cane-sugar from the diet, depends for its sanction on the tendency of that in other respects desirable food to ferment in the alimentary tract and disturb digestion. The fourth requirement, to be sufficiently laxative to insure a bowel movement daily, is directed against that colonic stasis which favors so powerfully the production of putrefaction poisons. The fifth requirement, to limit the total amount of food to the needs of the body, has for its reason the advisability of making as light as possible the necessary work of the liver and kidneys, so that those organs can devote their fullest energies to neutralizing and eliminating the putrefaction toxins to which the tissues are intolerant.

Besides these essential requirements we have to consider, in prescribing an antiputrefactive diet for a particular patient, the indications and contraindications offered by his general condition and by special diseases which may be present. In some cases it is sufficient to reduce the putrefiable protein to a moderate amount; in others it must be cut out of the diet altogether; in some the restriction of the total amount of food to the needs of the body should be as close as possible, while in others more latitude may be allowed; in young persons and those without demonstrable organic disease considerable latitude may be often allowed, provided the articles of food are appropriate; in older ones who have cardiovascular disease or nephritis, the total quantity of food should be closely restricted. The influence of habit is entitled to some consideration, especially in regard to the articles of food; it is not always advisable to put on an absolutely fleshless diet an elderly person who has been an extravagant eater of meat all his life; though such a one often accommodates himself to small and infrequent rations of flesh food, or even absolute deprivation of it, after having experienced the benefits of the more rigid diet; this is particularly the case when chronic nephritis is present.

Just what constitutes the minimum quantity of food necessary to maintain health—that is, the minimum amount of protein, and the lowest caloric requirement—the writer asserts he does not know, but clinical experience inclines him to the opinion that it is considerably less than what the standard text-books on diet assert. In his antiputrefactive diets he rarely gives more than 64 grammes of protein per diem unless the patient is extra large; and the calories he regulates according to the body weight, the age, the amount of work to be done, and the temperature; a man working hard in cold weather might require thrice as many calories as one lying in bed in a warm room. In chronic putrefaction toxemia the regulation of the fuel ration is not of such precise importance as the regulation of the protein ration; a few extra calories do little harm if they are derived from articles which do not disturb the alimentary tract or the liver. If the patient is obese he usually scrimps the calories, and if he is emaciated he is generous with them.

In arranging his antiputrefactive diet the

author usually relies chiefly on milk, bread, and cereals for protein, and secures extra calories from butter, olive oil, fat bacon, the starch of the roots and other vegetables, the sugar of fruits and honey, and milk sugar. One quart of milk, 12 ounces of cooked cereal, and six slices of bread will give about 55 grammes of protein and 1300 calories. The vegetables, fruits, butter, bacon, etc., given to bring the calories up to between 2000 and 2500, will add enough protein to make the total of that food element about 65 grammes. If more protein is required he increases the milk or cereals, or adds cheese, or allows a small quantity of animal protein; in many cases of putrefaction toxemia a small portion of meat, fish, poultry, or eggs can safely be allowed once to four times a week; and if such a relaxation of the diet increases the protein too much the milk, cereal, or bread can be diminished to make the protein ration balance. Vegetables and fruits, though poor in protein content and of small fuel value, have an important place in an antiputrefactive diet because they supply neecssary salts, add variety to the diet, which is often monotonous to the patient, relieve constipation, and are "filling."

GONORRHEAL ARTHRITIS.

STOCKMAN in the *British Medical Journal* of December 2, 1911, writes on this topic. In his paper he puts on record the results obtained by the vaccine treatment of nine cases of gonococcal arthritis. The number is not large, but they were carefully selected as uncomplicated cases, all of which suffered only from urethritis or vaginitis, and arthritis, so that treatment was not made more difficult or prolonged by such complications as cystitis, conjunctivitis, prostatitis, etc. In all, the gonococcus was isolated from the urethra, vagina, or a joint, and cultures made. Autogenous vaccines were mostly used, but not exclusively. Three of them were treated at first with salicylates to make sure that they were not cases of true rheumatism; in the others vaccine treatment was begun at once. They were all cases of moderate severity, and otherwise in good health.

In all, the treatment was at first exclusively by the vaccine, but in most of the cases no distinct improvement followed, and after waiting a reasonable time ordinary local treatment was usually added or substituted. This was always followed by an immediate and distinct improvement in the local and general conditions, and was what finally led to cure. Only in one case did recovery take place under vaccine treatment alone, but improvement was so rapid and so marked after only one dose of five millions that, on comparing it with the results in the other cases, one cannot help feeling that the vaccine had nothing to do with it. The doses are marked on the charts, and a reference to these will show that varying quantities were used, this being done purposely owing to the different opinions prevailing as to the most suitable dose. The author asserts he was unable to give the large amounts recommended by Allen, on account of the violent reactions which sometimes followed on much smaller quantities.

Before a correct judgment can be formed of the value of vaccine treatment in gonococcal arthritis considerable experience is necessary of the clinical progress of the disease under other forms of treatment. His experience has been that the great majority of uncomplicated cases of ordinary severity which require hospital treatment can be usually cured in from five to eight weeks. For years past he has kept accurate records of such cases, and his charts indicate briefly the progress of two of average severity. They compare very favorably with the similar cases treated by vaccine. The ordinary plan of treatment which he now adopts is to administer full doses of copaiba, to apply to the affected joints or fibrous tissues a dressing of oil of copaiba (three parts to one part olive oil) after it has also been gently rubbed in, and to use bougies containing 2 or 3 per cent silver nitrate for the urethra. In women the vagina is douched twice daily with solutions of mercuric chloride (1 in 1000 and 1 in 2000), or calx chlorinata (1 in 100), or

potassium permanganate. These are frequently changed, and after the douching, solution of hydrogen peroxide or silver nitrate is freely used and a certain amount left in. If the cervix is deeply infected it is a practical impossibility to free it from the gonococci. If there is much fluid in a joint it should be tapped, and to avoid the formation of adhesions the joints should be gently moved several times daily. The pain of movement is often so severe, however, that patients will not allow this to be done.

The results here detailed, along with those got in other cases, have forced the author to the conclusion that the administration of dead gonococci exerts no curative influence in gonococcal arthritis—that it is, in short, valueless as a practical clinical treatment. Theoretical considerations also seem to bear this out. It is accepted that healthy animals can be highly immunized against certain diseases by inoculating them repeatedly with the corresponding dead bacteria—as, for example, in the case of the common pyogenic staphylococci and streptococci. There is, however, no general law with regard to this, for with many diseases it has been found impossible to confer any appreciable immunity on healthy animals by inoculating them with cultures killed by heat (tuberculosis, for instance). But even in those diseases where insusceptibility to infection can be induced by the injection of dead bacteria, it has still to be shown definitely that, with the disease already established, cure can be brought about by the subcutaneous injection of dead bacteria. Increased insusceptibility to an infective disease is one thing, the power of recovery from it is another, and it is far from certain that the latter can be conferred in all or even many diseases by injecting the corresponding dead bacteria under the skin. It has been carefully tried in bovine tuberculosis and has proved a failure. On the other hand, in the case of staphylococcic infections in human medicine, much evidence has been adduced to show the curative value of the proceeding, but it is certainly not a general law and probably is not even of wide application. In the special case of the gonococcus it is acknowledged that even the living germs can produce little or no general immunity, and no antibodies are so far known in man, hence cure by dead organisms is still more unlikely. The author found that fresh joints sometimes became affected while the vaccine treatment was being given, and this should not have happened if the vaccine was capable of conferring immunity or even of increasing substantially the resistance to infection.

It is a matter of great clinical interest to determine whether the reaction after the administration of dead gonococci can be used as a method of diagnosing gonococcal infection. Irons has already done some work in this direction, and he states that eight adults who had no gonococcal infection showed no reaction after a hypodermic injection of 500,000,000 dead gonococci, while infected cases invariably reacted. When fully developed the reaction consists in increased pains in the joints, a rise of temperature, malaise with sickness and vomiting, and looseness of the bowels. There is sometimes redness at the site of the injection. These symptoms may last for a few hours up to a day and a half, and are apparently due to anaphylaxis. They vary much in intensity with the same dose and with different doses, and may soon cease or may continue to recur after each injection. In most cases, however, the reaction ultimately ceases.

In testing the reaction of healthy adults to polyvalent gonococci vaccines the author found that an injection of twenty to fifty millions caused a very slight rise of temperature (1° to 2° F.), with no other symptoms, while 150,000,000 caused a more distinct rise but no malaise. If the reaction symptoms develop unmistakably after a sufficient dose of vaccine, it may be concluded that a gonococcic infection is present. But the reaction varies so much with the patient, and probably also with the vaccine used, that it is impossible to define more accurately what is "a sufficient dose" for diagnostic purposes, and this irregularity seriously impairs the value of the method.

INOCULATION AGAINST PLAGUE AT NAGPUR.

The *Indian Medical Gazette* for November, 1911, says of this plan to combat the plague at Nagpur that the statistics collected may be taken as trustworthy, and the relative case incidence and case mortality among the uninoculated in the table given below may be accepted as reasonably accurate. The subjoined table shows in a clear and precise manner the relative protection from plague which may be expected from inoculation. It has been constructed from a summary of 551 investigation sheets referring to plague-infected households only. The figures are collected from households containing protected as well as unprotected members who were exposed to infection, and among whom cases of plague subsequently occurred.

	Total number.	Cases.	Deaths.	Case incidence.	Mortality per cent.	Case mortality per cent.	Per cent immunity from death of inoculated.
Uninoculated	2224	742	571	33.36	26.67	77.09	
Inoculated at mills.	752	74	10	9.84	1.33	13.51	94.82
Inoculated outside.	131	15	6	11.45	4.58	40.0	82.35
Total of inoculated	883	89	16	10.08	1.81	17.97	99.95

From the facts and figures given above we can come to the following conclusions:

1. That inoculation markedly reduces case incidence.

2. That it also greatly reduces case mortality.

3. That inoculation as such is quite harmless.

4. That it is also harmless even when a person is in the incubation stage.

5. That the temperature reaction after inoculation is, as a rule, of a mild type.

6. That it has no bad after-effects.

7. That the attack of plague in an inoculated person is generally of a mild type.

The author commends the above figures and the conclusions deduced from them for the careful consideration of employers of labor in the principal towns. Plague is more or less endemic in big towns. Past experience has shown that the epidemic has its worst results among the laboring population, who crowd in dingy, ill-ventilated localities. Evacuation on an adequate scale is in their case out of the question, and even were it so possible, it does not, without inoculation, afford the same degree of immunity as preventive inoculation even without that which evacuation provides. No preventive measure at once so cheap and so effective has yet been known to science as inoculation, and the author trusts that the results of the Nagpur inquiry will convince our captains of industry of its striking advantages and persuade them to resort to it in time during an epidemic for conservation of labor and saving of human life.

DISINFECTION OF THE SKIN BY THE TINCTURE OF IODINE.

NOGUCHI (*Archiv für klinische Chirurgie,* Bd. xcvi, H. 2) gives the following as advantages of the use of tincture of iodine in the disinfection of the skin according to the method of Grossich: Simplicity, which is especially important in military surgery, country practice, and when traveling; rapidity; cheapness; the border of the disinfected area can be constantly determined with certainty; the operation field can be quickly extended at any time, so as to enable the operation to be immediately carried into a field not previously prepared; in case of injury the wound is not soiled and irritated, as by the methods of disinfection previously in use; rubbing of the skin is not necessary, a procedure which is very painful and dangerous in certain conditions and must be carried out under anesthesia, which is thus lengthened unnecessarily; by this method it is not necessary to expose a large area of the body in the preparation of the patient, and he is saved the unpleasant sensation of cold and wet to which he is exposed in the ordinary methods of disinfection; tincture of iodine is a stronger disinfectant of the human skin than are other materials; healing by first intention is more certain, and the resultant scarring is very slight.

Disinfection of the skin of the operation field by means of tincture of iodine after the method of Grossich is not only from the clinical but also from the bacteriological point of view to be highly commended. In bacteriological experiments the method excels that of disinfection previously in use. One can begin the operation two minutes after a single painting with iodine. The second application of iodine tincture is not absolutely necessary, as the number of germs is but very little further diminished by the second application. Of greater importance is it that the first application be energetically made. Complete eradication of bacteria in the skin is not accomplished by the Grossich method. This method is not suitable for disinfection of hands nor for the field of operation in some cases, as, for example, in Basedow's disease it is to be avoided on account of the danger of iodine intoxication, and in Thiersch skin grafting if iodine is used the grafts will not hold. Previous washing of the skin with soap and water and shaving do not interfere with this method of disinfection, provided the skin be dried before the iodine is applied. The use of too great a quantity of iodine may have a harmful effect.

VERMINOUS ENTEROSPASM CURED BY ENTEROSTOMY.

KIESELBACH (*Beiträge zur klinische Chirurgie,* Bd. 76, H. 1) says that it has long been a debated question as to whether an accumulation of ascarides in the intestine could produce a fatal illness. A few cases have been observed which seem to demonstrate that this is possible. The author reports the following:

A servant-girl, aged fifteen years, of previously sound health, became suddenly ill on March 29, 1911. She arose in the morning in good health, the bowels and bladder were emptied in the normal manner, but about an hour later she was seized with nausea. This was soon followed by sudden severe pain in the abdomen below and to the left of the navel. The patient vomited twice. As she lived near-by, she walked to the hospital, but collapsed on reaching there. The pulse was 56 and the temperature 35° C. The girl groaned continuously and was doubled up with pain. The abdomen was soft and not distended; there was tenderness to pressure to the left and below the navel, and in the cecal region there was a tumor about the size of an apple, but hardly tender to the touch. Halfway between the symphysis and the navel there was a resistance which extended somewhat downward and to the left. There was some loss of resonance over this area, but otherwise no pathological condition could be made out. In arriving at a diagnosis, volvulus, some affection of the genital tract, as rupture of a tube, or poisoning with suicidal intent were thought of, but further investigation contraindicated all of these.

On account of the serious condition of the patient an operation was decided upon. An incision was made in the linea alba between the navel and the symphysis. After opening the peritoneum a loop of intestine presented itself which had a circumference of about 15 cm.; the serosa was reddened, and the intestinal wall was obviously in a spastic condition. It could be observed that this distention was due to the presence in the lumen of the intestine of an accumulation of roundworms. The mass extended for a distance of about 10 cm., then, after a short interval, for about 10 cm. further, with scattered worms at either end of the mass, so that about 60 cm. of the intestine was affected. The appendix and cecum as well as other abdominal structures were normal. An incision 2 cm. long was made in the intestinal wall, and through this the ascarides were removed one after the other by means of pincers. In all sixty-two worms were removed. The scattered ones were allowed to remain. The intestinal wound was sutured in two layers and the abdomen closed. The patient quickly recovered. The pulse returned to normal, the pain disappeared.

On April 3 the patient had the first movement of the bowels, and this contained one worm. On the fourteenth day she was

discharged, cured. Later she was treated for worms in the medical clinic, but none were passed. A history obtained later showed that the patient had often passed worms in childhood, the last one two years previously. At no time did she have any symptoms which could be ascribed to infestation with worms.

PERITONEAL ADHESIONS.

RICHARDSON (*Annals of Surgery*, December, 1911) thus summarizes a study on this subject:

Peritoneal adhesions are of two kinds, those which are useful and those which are harmful and dangerous.

It is futile to search for some agent that will banish adhesions from the realm of abdominal surgery, inasmuch as the processes involved in their formation are identical with those involved in peritoneal repair.

In dealing with peritoneal adhesions, the surgeon has recourse to three classes of procedures: (1) measures which prevent their formation; (2) measures which restrict their formation to the harmless variety; (3) measures which aid in their absorption.

Certain anatomical and physiological characteristics of the peritoneum have an important bearing on the problem of peritoneal adhesions; notably its extensive area, its remarkable absorptive power and ability to successfully cope with infection, the variable sensibility of different portions, the continuity of its endothelial surface, the rapidity with which it can form adhesions, and the completeness with which it can later absorb them.

Injury or death of the highly vulnerable surface endothelium is sufficient to set in motion the chain of pathological events which may terminate in dense adhesions.

Etiologically, there are a number and variety of factors involved, but they can all be grouped under the two heads—sepsis and trauma.

As specific prophylactic and curative measures, emphasis should be given to: (1) rigid asepsis; (2) the use of moist hot gauze; (3) careful covering of all raw surfaces; (4) avoiding unnecessary exposure; (5) restricting trauma; (6) gastroenterotomy and enteroenterostomy; (7) returning the viscera to their proper anatomical relationship; (8) spreading out the omentum over the visceral surfaces before closing the abdomen; (9) careful closure of the peritoneum. A number of additional safeguards are available which have been tested and proved to be of value under certain conditions. The most reliable of these for general use are: (1) viable grafts of omentum or peritoneum; (2) lubricants; (3) judicious ante- and postoperative therapy—especially with reference to posture, catharsis, enemata, and length of stay in bed.

The field of specific chemotherapy offers the brightest hope for future progress.

Success in the management of the more aggravated adhesion case depends largely upon accurate clinical diagnosis, followed by intelligent operative procedures.

In properly selected cases, the use of adjacent mesentery for covering raw bowel surfaces offers distinct advantages over all methods hitherto proposed.

PENETRATING WOUND OF THE PANCREAS CURED BY OPERATION.

FOWELIN (*Archiv für klinische Chirurgie*, Bd. 95, H. 4) states that isolated gunshot or stab wounds of the pancreas are very rare, because as a rule other organs are injured at the same time. The case which the author reports is that of a woman twenty-four years of age, who had stabbed herself in the upper part of the abdomen with a long-bladed knife having a narrow, sharp tip. The patient was brought to the hospital, and operation begun one and three-fourths hours after the injury. Incision was made to include the knife wound and extended along the left costal margin. A small wound was found in the border of the omentum, but the left lobe of the liver, stomach, intestine, spleen, and blood-vessels were all intact. A wound from which the blood flowed freely was

found in the body of the pancreas. The blood-vessels were ligated, the wound sutured, and the abdomen closed with a drain leading down to the pancreas. During the operation the patient was almost pulseless, but several subcutaneous injections of camphor and the introduction of saline solution subcutaneously and intravenously improved the pulse, so that by evening the rate was 110 and its volume fairly good. Twelve days after the operation the drain was removed, and in five weeks the wound had closed. A week later the patient was discharged in good general condition.

THE TREATMENT OF EXOPHTHALMIC GOITRE.

THEODOR KOCHER (*Archiv für klinische Chirurgie,* Bd. xcvi, H. 2) says that the treatment of exophthalmic goitre is governed by the fact that the thyroid has in all forms of the disease undergone an anatomical change which results in increased function. This applies to the primary form of struma ushered in by nervous symptoms, as well as to long-standing cases of thyroid disease which are later converted into the exophthalmic form, or the toxic or infectious form of strumitis which result in hyperplasia of the gland. There is therefore no basis for carrying out a different treatment in the neurotic forms of the disease than is carried out in the so-called secondary forms of Basedow's disease. The rapid and permanent elimination of the symptoms is dependent on the elimination of the disease from the thyroid gland. Among these conditions an important feature is the early removal of the hyperplasia upon which the overactivity depends. Attention is called to the fact that the leading experts in internal medicine and neurology have been induced by the excellent results which have been obtained by timely and well-carried-out operations to turn over their cases without reserve for the earliest possible operation after diagnosis has been made.

The favorable results which have been obtained by the operative removal of the diseased tissue support the theory of hyperthyroidism in this disease. The etiological factors which are of so much significance in bringing about the symptoms of the disease when properly studied afford many suggestions as to the internal treatment. The importance of these etiological factors in reference to the treatment is shown by the sudden accentuation of the symptoms when the general health becomes run down, when there is great mental worry, during an acute attack of sore throat, or when an empiric undertakes to treat a case by the energetic administration of iodine. On the other hand, mental and bodily rest, as by a sojourn at the seashore, and the avoidance of iodine medication, will produce a cessation and a retrogression of the most acute symptoms. However, the histological changes in the thyroid do not cease under the influence of these measures, and the disease advances under the constant harmful influence of the thyreotoxic gland secretions.

There are still a large number of physicians who undertake to treat Basedow's disease in its early stages with all sorts of medicines, and to send the patients from sanitarium to sanitarium, referring them to the surgeon only when the patient has become convinced of the uselessness of these measures and has lapsed into the miserable condition which characterizes the late stages of the disease. In this state the patient is unable to endure anything; he complains on the least excitement or exertion of fatigue and palpitation of the heart, with a feeling of depression and anxiety, and the surgeon must deny him the operative assistance which he so urgently desires because it is unwise to subject him to the pressing danger of operation. When a toxic condition is clearly seen to be developing from a diseased thyroid, and which will with certainty in time lead to marked organic changes, especially to fatty degeneration of vital organs, as the kidney, liver, and heart, then the only rational and wise treatment is to eliminate the cause of these changes, which is the poisonous substance itself.

If Eppinger and Hess are correct in assuming that status thymolymphaticus is due to excessive vagus action, then a sudden reduction of the activity of the vagus combined with increased function of the sympathetic must exert an unfavorable influence upon the heart and can account for the severe postoperative tachycardia which sometimes occurs. These cases must be reckoned with even when early operation is done, and the author's method of successive operations is especially to be recommended.

The secretion of the thyroid can be repressed in different ways. Of the operative methods the mildest are the ligation of vessels and the section of nerves. Of the ligations the least disturbing is that of the superior thyroid artery; it produces the least injury to the tissues and can be quickly performed. In the presence of large vessels benefit can be obtained by tying one superior artery, and later on the second may be ligated; later still one-sided excision may be done, and eventually the remaining inferior thyroid artery can be ligated. Instead of ligation of the isolated artery, an easier method is to ligate or cut through the upper pedicle of the gland. This has the advantage that the nerve is cut through, and as a consequence reduction in secretion and atrophy of the gland are brought about. One must not, however, deceive himself that in the severest cases ligation of one or both upper vascular pedicles is to be done without due consideration, for, in the author's experience, out of 17 deaths, five followed simple ligation of the pedicles; but these were all advanced cases.

In cases of colloid goitre which have assumed the exophthalmic form, excision of the diseased portion of the gland is the suitable procedure. Resection of the lower pole of the thyroid constantly involves the danger of tetany through interference with the nourishment of the parathyroids. Those who practice this have a high mortality. After operation the patient should have a long rest, bodily and mental. A stay in a sanatorium is of especial value as it implies the proper dietetic treatment. A very important point is the avoidance of iodine preparations in the postoperative treatment. Of internal medication the phosphorus combinations appear to exert the most favorable influence.

TRANSPLANTATION OF FREE FASCIAL FLAPS.

Davis (*Annals of Surgery,* December, 1911) thus describes his technique: The part was shaved, washed with green soap and water, then with alcohol and ether. After the skin was thoroughly dry it was painted with tincture of iodine 2.5 per cent. The iodine solution was also freely used in the open wounds and after suture of the skin.

Fine black silk was the ligature and suture material used throughout. The wounds were closed in layers wherever possible. The skin was closed in every instance with the buttonhole stitch.

Dry sterile gauze secured by a bandage was used wherever dressings were applied.

The fascia was obtained, for the most part, from the thigh, the iliotibial band of the fascia lata being the most satisfactory portion to work with, as it is easily separated from the underlying tissues. In a few instances the strong abdominal fascia was employed.

The fascia was transplanted in both single and double layers, and in one or two instances was twisted.

In each experiment where adhesions were not desired the fascia lata (iliotibial band) was placed with the inner or muscle surface exposed. For example, when a flap of fascia was placed in a peritoneal defect, the muscle or smooth side was turned toward the peritoneal cavity, and it was found that dense adhesions were less likely to occur than when the outer side was turned toward the cavity.

Davis believes that many of the difficult situations arising during operations for the repair of weakened and defective tissues or for the control of bleeding surfaces will be simplified by the use of free fascial flaps. When the free fascial flaps were transplant-

ed into the subcutaneous tissue or muscle, periosteum, bone, cartilage, tendons, and ligaments, microscopic examination of the specimen showed that the fascia retained its own structure after transplantation and was apparently healthy and well nourished. This was true even after being kept in cold storage for thirty-five days and then transplanted into another animal. It was also shown that muscle and tendon defects may be bridged by free flaps of fascia. The fascia united firmly with the muscle ends and formed a strong symmetrical band between them. The use of fascial flaps to replace tendons is of especial importance and most promising clinically. While it is a well-known fact that free tendon transplantation can be successfully done, it must be borne in mind that it is often difficult to secure either long or short pieces of tendon without doing considerable damage.

There are large amounts of fascia available in the body which can be secured without damage to any other working part. Thus tendons of any desired length might be made from strips of the iliotibial band of the fascia lata.

Experimentally the tendons made of folded strips of fascia are not liable to adhere to surrounding tissues. Fascial flaps might also be used to prevent tendons from being caught in scar tissue. The final results after replacing tendons with this material are more satisfactory than with any foreign material or transplantable tissue with which Davis is familiar.

Free flaps of fascia were successfully transplanted into joints and also to take the place of patellæ which had been removed.

Bones were fractured and the fragments sutured with strips of fascia. The results of these last experiments were unsatisfactory on account of the difficulty in immobilizing the fragments. However, the use of fascia strips in the open treatment of fractures in human beings may be of great use clinically, as immobilization can be secured.

The fascia does not act as a foreign body, and has strength enough to stand any reasonable strain put upon it.

Experiments also showed that flaps of fascia inserted in skull defects between the dura and bone edges will heal and give a strong membrane which will resist considerable pressure from within and without. When the dura is removed in addition to the bone, the fascial flap tucked under the bone edges will unite with the dura and also become tightly adherent to the bone edges.

There was in each instance a single fine adhesion of the cortex to the center of the fascial flap.

Fascial flaps might be used clinically in repairing skull defects and as an aid in closing of spina bifida.

Free flaps of fascia may be successfully used to cover prepared defects in the trachea, without subsequent infection; the mucous membrane grows across the fascia covering the defect.

It is also shown that free flaps of fascia may be sutured into peritoneal and muscle-fascia defects in the abdominal wall, and that it will incorporate itself with the surrounding peritoneum and muscle edges. A small omental adhesion was present on examination of the specimen in each instance, but in no case was there adhesion of the gut or any other abdominal organ to the fascia.

When a hernia was produced by the removal of a portion of the abdominal wall, except the skin, it was readily cured several weeks later by the transplantation of fascial flaps.

These experiments suggest the use of fascial flaps in the cure of large herniæ, where the muscle is atrophied, and for strengthening any weakened area in the abdominal or chest wall. The facility with which the fascia unites with the peritoneum suggests its further use in pleural and pericardial defects.

It is also suggested that fascia may be used to strengthen suture lines and weakened areas due to ulceration. It is further suggested that fascial flaps may be used to support sutures in friable organs, and also to bind raw postoperative surfaces. In none of the animals was there muscle hernia after the fascia was removed, nor does

there seem to be any untoward effect after removal of the fascia lata as far as the use of the limb is concerned. In every instance the fascia retained its own structure and seemed well nourished. After removal from its bed it was as tough and strong as when first transplanted. The greater strength of the fascia and in addition its thinness and flexibility are to be noted. It can be sutured into a defect under considerable tension, and the sutures will hold securely even when inserted close to the edges or ends of the flap.

MISCARRIAGE AND RESULTS OF TREATMENT.

YOUNG and WILLIAMS (*Monthly Cyclopedia,* June 22, 1911) from an analytical study of the records of 2000 patients admitted for miscarriage or its complications in the Boston City Hospital, during the period of 1896 to 1910, submit the following conclusions:

1. Spontaneous emptying of the uterus takes place in but about 13.2 per cent of all miscarriages.

2. The likelihood of a miscarriage to complete itself increases with the duration of pregnancy.

3. When it becomes necessary to use artificial means to complete the miscarriage, the use of the finger followed by the curette in later miscarriages, and of the curette alone in the earlier months of pregnancy, has given uniformly satisfactory results.

4. Experience has shown that where the cervix is extremely rigid it is better to introduce the curette and break up the fetus and placenta and remove them piecemeal than to attempt to dilate the cervix sufficiently to introduce the finger.

5. Packing the vagina and lower uterine segment is an unsatisfactory and often unsuccessful method of emptying the uterus. No success whatever was obtained in treating incomplete miscarriages in this way.

6. Packing is, however, of great value in two classes of cases: First, in exsanguinated patients, to stop the hemorrhage and give the woman a chance to recover somewhat from the loss of blood before emptying the uterus. Second, when the cervix is very rigid, a tight cervical pack for twenty-four hours will soften it so that dilatation may be attempted with safety.

7. The results of artificial methods are as good as but not better than where nature has succeeded in emptying the uterus.

8. Artificial methods are necessary in a majority of cases, however, simply because nature has failed.

9. In infected cases the essential thing is to get rid of the infectious material by emptying the uterus.

10. The later in pregnancy miscarriage occurs, the smaller the liability to become infected, but the greater the likelihood of developing grave septic complications if infection does take place.

11. The mortality is practically the same at all periods of pregnancy.

12. Induced abortions have a greater mortality than accidental. The mortality of patients admitted to the hospital after criminal abortions was 10 per cent.

SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS.

MACNALTY (*Practitioner,* November, 1911) in reviewing this general subject observes that as early as the eighteenth century incision of tuberculous cavities of the lung had been recommended. Operative cases are reported in 1830. Up to 1897 only 40 cases had been published, these chiefly including cases of pneumectomy and pneumotomy. The results were so poor and mortality so high that scant encouragement was given to other surgeons to undertake these operations, but of late years new procedures have been devised with the object of assailing this problem. The five operations which have received recognition are pneumectomy, pneumotomy, Freund's operation, thoracoplasty, and the formation of an artificial pneumothorax.

Of these five operations, the first is radical in its aims, while the remaining four attempt to foster the natural process of

healing. With regard to the type of case chosen for operative treatment, when the whole of these methods are under review, both early and advanced cases of pulmonary tuberculosis have been selected, one particular form of operation being devised for a localized patch of infiltration of the lung, while another is indicated only in the stage of excavation.

As to pneumectomy, for both early and advanced cases of pulmonary tuberculosis: in the latter class without exception operation has been followed by the death of the patient, nor are the results of pneumotomy encouraging since the majority of subjects die within the first two days after operation. In the cases that survive the immediate effect of the procedure, though fever and hemoptysis may be abated, the drainage of the cavity appears to have little or no influence upon the general course of the disease. In rare instances in which the cavities open into the pleura or into the thoracic wall, pneumotomy has been followed by permanent improvement.

Freund's operation, or chondrectomy of the first costal cartilage, is based on the inference that a congenital shortening of this cartilage, together with its thickening and rigidity, the latter intensified by calcification, forms a serious barrier to the full expansion of the lung and is a cause and not an effect of tuberculosis; for the apex of the lung thus restricted in movement, imperfectly aerated, and poorly supplied with blood becomes a favorable nidus for the tubercle bacillus.

Freund noted that in this type of case the accessory inspiratory muscles exaggerate their action and, struggling against the constriction of the lung, in many instances by their contraction crack or fracture the abnormal costal cartilage. As a result of this a false joint is made.

Freund found such a pseudoarthrosis associated with many healed apical lesions, and this led him to recommend the operation of chondrectomy. The indications for this are the physical signs of early pulmonary tuberculosis, restricted to one apex, supported by measurements showing a diminution in the diameters of the superior orifice of the thorax, and *x*-ray examination. In addition Freund suggests exploration with a needle to ascertain the thickening and calcification of the cartilage. The operation, of course, merely aims at putting the affected apex in better condition to resist the attacks of the disease. Up to 1909, however, only five cases had been operated upon.

Resection of the ribs, thoracoplasty, with the aim of bringing about the falling in of the walls of the cavity was first practiced by Cerenville in 1885. Cerenville's patient died on the fifteenth day, and the operation fell into comparative disuse until the years 1898-99, since when cases have been recorded more frequently, the chief surgeons advocating this treatment being Turban, Landerer, Spengler, and Friedrich.

Landerer stated in 1902 that the operation was of value in chronic and afebrile cases, being contraindicated in rapidly advancing disease. He usually resected four to six ribs according to the extent of the lung involvement, and did a pneumotomy seven days after the thoracoplasty. The patients operated on showed marked improvement; they gained in weight and the expectoration was diminished or suppressed. Spengler and Friedrich's operations are somewhat more extensive in respect to the number of ribs resected.

As early as 1882 Forlanini advocated artificial pneumothorax. He observed that tuberculous patients with a pneumothorax do not always die, and that in cases which recover the tuberculous lesion often appears to be healed. It has further been noted that if a pleural effusion occurs in an advanced case of chronic pulmonary tuberculosis, the onward progress of the disease is frequently arrested and the condition ameliorated. These favorable results, it would appear, are due to the rest enforced upon the affected lung by the pneumothorax or effusion, just as a rheumatic joint responds to salicylates when kept at rest, while the endocarditis does not because the heart is obliged to continue working. So the lung, relieved in some part of

its function of respiration, has leisure to defend itself against the invasion of tubercle.

Bier's view on the subject is that the lung is put into a condition of hyperemia and its resisting powers are consequently augmented.

It follows then from these pathological analogies that the tuberculous chest might be immobilized by injecting liquid or gas into the pleural cavity, artificially producing in the one case a pleural effusion, in the other a pneumothorax. For the formation of an effusion injections of sterilized oil or of physiological serum have been employed (Schmidt), but the pyrexia and pleurisy that too frequently ensue, together with the possibility of pulmonary gangrene arising through puncture of the bronchi and lung, appear to contraindicate this plan of procedure.

The general consensus of opinion is that the operation of artificial pneumothorax should be performed on cases of chronic pulmonary tuberculosis in the stage of excavation. Murphy, it should be mentioned, holds a contrary view and states that the most practicable cases are "apical or monolobar tuberculosis in the early stage, as the pathological conditions are such that the compression of the lung can be accomplished and adhesions are not likely to be found." He excludes advanced cases, "as the fibrous tissue deposited in the lung will not permit compression of the lung, nor will the pleuritic adhesions allow of gas injection."

It is clear that for the manufacture of an artificial pneumothorax air or gas must be employed which is capable of slow absorption. It was found in the earlier experiments that air and oxygen were unsuitable on account of their ready absorption by the lung, and that nitrogen, a slowly absorbing gas, was preferable, and is, in fact, the gas principally employed in this operation.

Briefly, a sterilized needle is taken and connected with a U-tube containing the nitrogen, fitted with a manometer which registers the pressure and the volume of the gas injected into the pleura; the point in the chest wall through which the pleural puncture is made depends on the state of the disease in the individual case.

Authorities differ as to the amount of gas that should be injected, some favoring the injection of large quantities at lengthy intervals of time, while others advocate small amounts injected frequently until immobilization and collapse of the affected lung is secured. On the whole, the injection of small quantities of gas at a sitting appears preferable, the dangers of the former method being asphyxia—the compressing force being exerted on the sound lung as well as on the diseased one—and the sudden reflux of the contents of cavities into the bronchi of the unaffected lung.

The general and favorable results of an artificial pneumothorax are synonymous with those displayed by any improved case of chronic pulmonary tuberculosis. The cough abates, the expectoration diminishes or ceases, hemoptysis, if present, disappears, and the temperature returns to the normal. (It may be further added that the clinical evidence of excavation gives place to the physical signs of pneumothorax.)

There are nearly 200 authentic cases on record, many of which show the marked amelioration of symptoms described above, but as they have been chiefly reported during the last three years the curative value of the operation must still be regarded as an open question.

Forlanini had two patients who died from an intercurrent malady after a pneumothorax had been made, and at the postmortem examination each case showed healing and fibrosis of the pulmonary lesion; on the other hand, Brauer's three necropsies demonstrated incomplete arrest.

Death has occurred from asphyxia (large injections), syncope, and air embolism at the time of operation. In other cases the pneumothorax could not be made owing to the presence of pleural adhesions, or the treatment has been interrupted by the outburst of active tuberculosis in the previously unaffected lung. The pneumothorax has persisted in some instances.

The subjects selected for the operation have been principally those suffering from chronic pulmonary tuberculosis; in two or three cases the tuberculous lesion was an acute process.

FACTS AND FALLACIES IN THE TREATMENT OF SYPHILIS WITH SALVARSAN.

BOEHM (*New York Medical Journal*, Dec. 2, 1911) thus summarizes a study of this subject from both the clinical and experimental standpoint.

Salvarsan is a chemical of which comparatively little is known, pharmacologically. It produces very quick healing in most cases of primary and secondary syphilitic lesions. It is a valuable adjunct in the treatment of syphilis, but has not entirely displaced mercury or iodine, and should be used in conjunction with these latter drugs in all cases of syphilis, no matter of how long standing or how long a course of previous treatment a patient may have received.

A physician is justified in using it only after he has had some experience, and he should not jeopardize a patient's welfare by injecting into a muscle a corrosive chemical, such as salvarsan, which is destructive to muscle tissue by its escharotic and corrosive action.

There is only one method of administration safe for a patient and from which the maximum amount of benefit will speedily result—that is, the intravenous. This must be executed with the proper technique and apparatus only after a patient has been carefully studied in regard to his circulatory apparatus, determining the blood-pressure, condition of the kidneys, liver, etc. Chronic alcoholism is one of the most marked contraindications. Paresis and all cerebrospinal diseases, in which there is marked cardiovascular degeneration, are also contraindications.

Any case presenting evidence contraindicating the intravenous administration of salvarsan should be rejected as a case unfit for its use, either intramuscularly or subcutaneously. Every patient receiving an intravenous injection should remain quietly in bed for the first twenty-four hours. The making of a solution of salvarsan is a very simple procedure, and does not require the service of a chemist. If a physician is not competent to make such a solution, then he is not qualified to administer it. All solutions should be freshly made, immediately at the time of use, at the bedside of the patient, or in the operating-room, with the proper aseptic technique.

A single dose of salvarsan will not cure syphilis. No patient to whom it is administered should receive any positive assurance in regard to its ultimate efficiency. Not every individual responds equally well. Some patients may require three or four doses to produce a negative Wassermann reaction, and even in such a condition, who can assure his patient that he is cured absolutely?

A single dose of salvarsan, as a rule, produces only a mild parasitotropic action; the good results following an initial dose may be due more to its improving an existing anemia, and producing a stimulating effect on body metabolism. This should be explained to the patient, as most laymen are under the impression that a single dose is curative of the disease.

We must not promise too brilliant results from salvarsan. Each case of syphilis depends on the personal equation; each syphilitic patient is a specific case in itself. Candidates for matrimony with a positive Wassermann reaction should not be assured that a prematrimonial, sterilizing dose of salvarsan will eradicate all possible future traces of a former syphilitic infection.

Since the lay press has published so much about "606," the tendency to create many syphilophobiacs exists. Many of such persons have had a syphilitic infection years previously, married years later, having a healthy family, and apparently all traces of the former disease have been eradicated. Such patients, with a negative reaction and no traces of syphilis, should not be given salvarsan recklessly.

We must guard against a tendency toward a diagnostic syphilomania, medically speaking. Do not believe that every one has had syphilis and needs "606" until the absolute existence is proved, and an imperative necessity for the administration of the drug exists. American statistics show that about eighteen per cent of our population has syphilis.

EIGHTY-ONE CONSECUTIVE CASES OF CLEFT PALATE TREATED BY OPERATION.

Berry (*British Medical Journal*, Oct. 28, 1911) tabulates 81 cases, which include all those on which he has operated from 1905 to the present date. He has not refused to operate upon any case under the age of sixteen, however wide or unpromising the cleft, except in a very few instances in which the general health was so bad that no operation at all seemed justifiable, and in a certain number of those in which one or more previous operations, performed by other surgeons, had resulted in so much destruction of tissue that no further operation was possible. In cases in which the previous unsuccessful operation had been the turn-over flap, one commonly known as the Lane operation, the destruction of tissue was usually so great that no further operation could be attempted, the obturator treatment being recommended. In more than half the cases the operation was performed after the age of three years.

Berry believes that the best period in most cases for the performance of cleft palate operation is between the ages of one and three, according to the nature and width of the cleft. In all cases the operation has been that of Langenbeck, or some slight modification of it, and the essential feature is not mere paring of the edges and median suture, but also the formation of a flap of mucoperiosteal tissue from the hard palate. In operating upon clefts of the soft palate Berry has to a certain extent replaced the lateral incisions by the wide tension stitch. Of the importance of detaching the soft palate from the posterior edge of the hard palate in all but the most trivial cases there can be no doubt whatever, if a good result is to be obtained. As to mortality, there was none.

Mr. Barrington Ward is quoted to the effect that the immediate operative mortality in a large series of Mr. Arbuthnot Lane's cases operated on during the first year of life was 18 out of 144 first operations in the first year of life (mortality 12.5 per cent), although Mr. Lane prefers to quote the figures 5.9 per cent, obtained by including secondary and tertiary operations as well as the primary operations upon the same patient.

Mr. Fagge notes that of a series of 38 of his own cases operated on under one year of age at the time of their first operation, three died in the hospital, but the ultimate mortality was much more alarming, and an effort to trace these patients showed that 14 others had died from various other causes, of which six were directly or indirectly due to subsequent operation for harelip. So that 17 out of 38 were known to be dead, and out of the remaining 21 it was not stated how many were traced and known to be alive.

Berry states that of the 59 cases of his series in which the hard palate was involved as well as the soft, union of the soft palate occurred fifty-eight times after operation. The fifty-ninth case was one of complete double cleft of the whole palate operated on at the fourteenth month; after the second operation union took place. Of the 21 cases of cleft limited to the soft palate, complete union after the first operation occurred seventeen times. One case of cleft of the soft palate was a complete failure, although the cleft was extremely narrow. The child was frail, fretful, and delicate. As regards union of the hard palate, in many cases the first operation did not effect complete closure, one or more, usually small, supplementary operations being required. Occasionally a large part of the cleft in the hard palate broke down after the first operation. In some cases of complete cleft, or of very wide cleft involving only three-quarters of the hard

palate, he has intentionally left the anterior part of the cleft to be closed by a second operation.

When once the soft palate and posterior part of the hard palate have been well closed, there is generally but little difficulty in closing the anterior part of the hard palate by a subsequent operation, since the separation of the soft tissues from the underlying bone can be effected with more freedom.

As to the effect upon speech, in some cases speech has been so nearly perfect that it is very difficult to detect there is anything wrong with it at all.

Berry narrated the case of a boy, aged nine, upon whose cleft (11 mm. wide and involving the soft and part of the hard palates) he operated at the age of three years and ten months. Neither Berry nor others who saw the patient with him could detect the slightest abnormality in his speech.

In several cases a very high degree of perfection in speech has been obtained as the result of operation. In most cases a considerable trace of nasal intonation remains, although the patients can pronounce all their consonants normally and can make themselves well understood. If the speech of all the cases in this series is not as good as the author could have wished, it must be remembered that much of his hospital material has been very unpromising. At least ten of the cases in Berry's series have been the subjects of previous operations by other surgeons, which resulted in much destruction of tissue, and several other cases were imbecile or otherwise the subjects of marked mental deficiency. From such cases it is scarcely reasonable to expect really good speech. An extremely good result was obtained with the oldest patient in Berry's list, a woman with complete cleft of the whole palate, operated on at twenty-six years. Berry states that his best results have naturally been with private patients, for whom lessons in articulation and careful training at the hands of a governess are obtainable. One of the difficulties that we have to contend with in hospital practice is that of obtaining for the patient after he has left the hospital sufficient skilled training in articulation, without which even the most perfectly restored palate will usually not give perfect speech.

The utmost that the surgeon can do is to restore the palate to its normal condition. Careful training in articulation, if obtainable, will do all the rest. But it should be skilled training, such as ordinary schoolteachers and the mothers of hospital patients are rarely, if ever, competent to give.

Berry states it as his firm belief that the turn-over flap operation, before many years have passed, will be performed solely by those who do not follow up their cases and who consequently do not know what their results really are.

ACETONE IN INOPERABLE CANCER OF THE UTERUS.

SAMUELS (*Maryland Medical Journal*, December, 1911) commends the use of acetone in inoperable cancer of the uterus, on the basis of excellent results obtained in five cases. He follows Gelhorn's method:

Under anesthesia the cavity or crater is thoroughly curetted. This is done to remove as much of the dead and necrotic tissue as possible. The curetted surface is then dried with cotton sponges. The Ferguson speculum is introduced to protect the vagina as much as possible. The patient's hips are elevated, and through the Ferguson speculum about one-half to one ounce of pure acetone is poured into the wound.

The anesthesia may now be stopped, and the patient left in this position from fifteen to thirty minutes. The acetone is now permitted to run out through the speculum by lowering the table, and the cavity is packed with a strip of gauze soaked in acetone. The speculum is removed gradually, and the excess of acetone that may have come in contact with the mucosa of the vagina is wiped off with wet gauze sponges. The surface is then dried, and a cotton tampon inserted into the vagina to absorb any excess of acetone.

After this preliminary curettage and first application of acetone the patient may leave the hospital the next day, as she does not require any future hospital care. The subsequent applications of acetone may be made at her home or in the physician's office. They should begin about five or six days after the patient leaves the hospital, and then be made twice or thrice weekly, if the symptoms require it. With the applications of acetone there is a progressive diminution of the crater, and smaller specula may be employed. In making subsequent applications of acetone, either in the physician's office or at the patient's home, the pelvis should be elevated, as in making the first application, and about the same amount of acetone applied. If the physician is without an office assistant, the patient may hold the speculum in position. Care must be taken, however, not to allow the acetone to run over the vulva. As a precautionary method, to prevent irritation from the acetone, it is a good plan first to coat the vulva and vagina with a layer of petrolatum. After the acetone is allowed to run out, the vagina should be swabbed and a large cotton tampon coated with vaselin introduced into the vagina before the speculum is completely withdrawn. The tampon may be removed by the patient in four or five hours.

The remote result from the application of acetone manifests itself in the marked reduction of the intense odor. The discharge, which at first is profuse and watery, gradually disappears; hemorrhages occur with less frequency, and are not nearly so profuse. After three or four weeks of this acetone treatment, a considerable diminution in the extent of the wound cavity is noticeable. The walls become smooth and firm, and in one instance the walls were so firm that the finger could not remove any friable tissue. With the stopping of the weakening hemorrhages and discharges, the general health of the patient for the time being improves visibly, and the pain is somewhat lessened. In two patients in whom cancer had extended to neighboring organs, while the discharge and hemorrhages ceased under its application, the pain was not relieved, and morphine in large doses was necessary.

COLOTOMY.

DANIEL (*Lancet,* Nov. 18, 1911) notes that clinical evidence, derived from the sensations of patients who have colotomies, clearly shows that most of the successful cases have very definite warning of the impending action of their colotomies; while others learn by certain sensations peculiar to each, and which are not normal warnings, when the bowel is going to act. Hence, even though the normal warning of an impending action of the bowel is absent after the performance of a colotomy, all warning is not cut off, or if it is "auræ" develop which efficiently replace the warning. Consequently we cannot maintain that one of the great disabilities of colotomy is the inability to know when the bowel is going to act.

He further holds that the many ingenious methods of endeavoring to manufacture a sphincter "to prevent diarrhea" are not only unnecessary but are bound to fail to effect this object—not even nature's sphincters can prevent diarrhea. But inasmuch as it is impossible by any method of performing colotomy known to him to retain the whole of the fecal reservoir, the sigmoid, the operation, by reducing the storage capacity of the bowel, inevitably interferes to some extent with the normal capacity to hold the accumulation of the twenty-four hours' débris, which means that the one normal daily evacuation will be interfered with. The nearer the rectum the colotomy opening is placed the less do we reduce the storage capacity, and *vice versa.* Hence the selection of the transverse colon as the site of a colotomy is absolutely indefensible, while the historical method of selecting the proximal end of the sigmoid is also incorrect; the question of prolapse apart, the ideal site for a colotomy is the junction of sigmoid and rectum.

As to the method of performing the operation, he advises the making of a spur by

means of a glass rod passed through the mesentery to sustain the bowel, the ends being protected by a rubber tube and the glass rod being removed on the seventh to the tenth day. In regard to future prolapse a constant expulsive effort due to diarrhea is the most important predisposing factor to this painful and disagreeable complication. Another is the "drawing" effect of even the best made colotomy receptacles, due chiefly to the want of an air vent, the introduction of which tends to leaking. The more the sigmoid retains its normal function of a reservoir the less the probability of prolapse, and we can prevent diarrhea; hence we can practically remove the most important factor conducing to prolapse.

In performing the operation of colotomy by the so-called "gridiron" method, it is wise after making the incision in the tendinous part of the external oblique in the direction of its fibers to notch the aponeurosis at right angles to the fibers. Daniel has known of at least two deaths from nipping of the wall of the intestine by the strong tendinous edge of the external oblique to such a severe degree as to lead to a linear band of necrosis of the bowel wall. Death was due to the intense toxemia following this necrosis.

TREATMENT OF PULMONARY TUBERCULOSIS BY INDUCING AN ARTIFICIAL PNEUMOTHORAX.

RHODES (*British Medical Journal*, Oct. 28, 1911) considers that the indications for this treatment are: (1) Pulmonary tuberculosis limited almost, if not entirely, to one lung. (2) Recurrent hemoptysis if at all severe. (3) Continued fever, cough, and general increase of disease on one side, while the other lung is healing, or only slightly affected.

Slight inactive disease in the fairly sound lung is not a contraindication. The increase in the blood flow through this lung seems to influence the healing process favorably. In some cases it is impossible to produce a pneumothorax, owing to extensive pleural adhesions.

The operative procedures divide themselves into two distinct stages—the preliminary operation and the after-filling. The patient's chest is examined with the *x*-rays, and a site for the operation is chosen where the pleura appears thinner and the disease less pronounced. The patient is given an injection of morphine. He lies on his side with a pillow under the sound chest. The skin and subcutaneous tissues are anesthetized with novocaine and adrenalin solution, after careful sterilization of the skin by painting with iodine, etc. The whole operation must be carried out under the strictest aseptic conditions.

An incision is made over the selected intercostal space, and the tissues are separated so that the external surface of the parietal pleura is exposed: this is facilitated by the use of the retractors invented by Brauer and Spengler. When a space about a quarter of an inch square has been defined, bordered by ribs and retractors, and having parietal pleura for its base, the latter is punctured in an oblique direction by a blunt hollow needle. If the operation is immediately successful, one hears a rush of air into the pleural space, and the needle is at once connected with a manometer having a three-way cock, so that nitrogen may be introduced through the needle, while the pressure is measured. The blunt needle and open operation obviate to a large extent the dangers of nitrogen or air embolism and of puncturing the lung tissue. Five hundred to a thousand cubic centimeters of sterilized warm nitrogen is allowed to flow into the pleura or injected under a pressure equal to 2 or 3 cm. of water. The warmed nitrogen obviates the possibility of pleural reflex. If the patient experiences much pain or seems faint, or his condition otherwise deteriorates during this injection, it must be stopped at once, but the idea is to make as large an air bubble in the pleura as possible, so that the after-fillings may be made with greater success and less danger of puncturing lung, adhesions, visceral pleura, etc. After a sufficiency of nitrogen has been introduced, the wound is sewn up, an antiseptic air-tight dressing is applied, the

chest is examined again with the *x*-rays, and the pneumothorax which has been induced is observed and its limits as far as possible defined.

If the blunt needle does not at once tap the pleural space, it may be necessary to pass a gum-elastic sound down its lumen to clear away any obstruction from the orifice of the needle or its immediate vicinity.

Two days later a sharp-pointed hollow needle, either such as that used by Saugman for his operation, or a blunt cannula of similar caliber and length with a trocar which can be removed, is introduced into the nitrogen bubble in the pleura, and a further 500 or 1000 Cc. of nitrogen is injected under a slight pressure (from 3 to 5 cm. of water). If adhesions are very dense this injection may be painful. The more these adhesions can be stretched, the more successful will the treatment be, and if some of the firm ones are broken down the lung collapse will be more complete, and in consequence the lung rest gained will lead to a more certain healing of the ulcerating and inflamed lung tissue. This after-filling must be repeated at varying intervals for at least two years.

The indications for refilling are pain or discomfort in the chest, slight fever, and return of the cough. In a certain proportion of the cases (about 30 per cent) an effusion forms in the pleura during the three or four months succeeding the commencement of this treatment. Patients who suffer from this complication often complain of much pain when the fluid is forming, but do not seem to progress less favorably; the fluid eventually clears up under a dry diet, and it is probably never necessary to aspirate the effusion.

It is most important to examine the chest with the *x*-rays before and after each filling, observing the size of the pneumothorax and the shape of the lung as determined largely by pressure in the pleura and pull of pleural adhesions.

Rhodes states that encouraging results have been obtained on the whole. He further notes that he has saved a large number of patients treated in the last five years, and that there is no doubt that several of his friends and patients have recovered from an apparently quite hopeless condition, and are now enjoying life as the result of this treatment. In 39 cases the lung condition has been greatly improved and the prognosis is favorable. In 14 patients the lung condition has been improved, but for some reason, such as abdominal tuberculosis, carelessness, or fresh infection of the other lung, the patient has not done well.

In 17 patients there has been no good result. Of the whole number 21 patients are now dead. These results have been obtained in patients who were all seriously ill and becoming worse.

Niehans has performed the operation, according to Brauer's method, twenty-four times. In seven cases he did not succeed in producing a pneumothorax. Of the remaining 17, one died nine months later of hemorrhage from an incompressible cavity. Seven are fit for work or at it. Nine are still under treatment, and the prognosis in these cases is described as good.

POSTOPERATIVE DROWNING.

GRUNBAUM and GRUNBAUM (*British Medical Journal,* Nov. 11, 1911) after calling attention to the fact that nearly all surgical cases of collapse are infused, irrespective of whether such collapse be due to loss of blood or to fall of blood-pressure, note that the immediate effects are usually sufficiently gratifying and dramatic to obscure from the surgeon's vision the resulting tragic ending. Yet postinfusional death from pulmonary edema is common enough to raise again the question, Was it inevitable? After observing that with scarcely an exception the anesthetic used in these fatal cases has been ether, the caution is urged in regard to the rapidity of its administration, the constitution of the intravenous injection, the temperature at which it is given, and the total quantity introduced. In many cases preoperative disease of both kidneys and the lungs has existed. The authors hold that saline infusion, especially intravenous, should be properly used only

to replace fluid lost from the body. Fall in blood-pressure due to other causes should be treated by other therapeutic means.

The procedure of infusion should be carried out with the same care and skill as the main operation.

If it is anticipated that saline infusion will be necessary an anesthetic other than ether should be chosen.

When coexisting renal insufficiency is suspected, intravenous infusion, especially in conjunction with ether as an anesthetic, is better avoided altogether. Rectal infusion appears to be less dangerous, and subcutaneous infusion seems to stand between the two.

MERCURIAL STOMATITIS.

LE BLAYE (*Thèse de Paris, Journal de Médecine et de Chirurgie,* Oct. 10, 1911) has conducted an experimental research upon the etiology of mercurial stomatitis. He found it impossible to produce this condition in rabbits or guinea-pigs, but dogs were extremely susceptible, exhibiting the characteristic gingivitis and shortly ulcerating and gangrenous patches upon the cheeks and the tongue, resulting, unless the mercurial treatment was stopped, in death. The point of major interest in his investigation lies in the fact that a microscopic examination of the exudate from these ulcerating patches exhibited always many fusiform bacilli and spirochætæ identical with those described by Vincent as characteristic of the angina which bears his name, from which the author concludes that mercurial stomatitis is not due to the venereal infection but is really the mercurial rendering the mucous membrane and the gums peculiarly susceptible to this form of infection. This belief is somewhat accentuated by Moller, who notes that patients subject to Vincent's angina are singularly subject to the influence of mercury, and that diagnostic error is likely to result most seriously for them.

The therapeutic deduction from these facts is to the effect that mercury in any form is strongly contraindicated in Vincent's angina, and that strict cleanliness of the mouth, together with a mild antiseptic, is likely to be the most potent means of preventing the development of mercurial stomatitis.

REVIEWS.

PRACTICAL TREATMENT. In Three Volumes by Eighty-two Collaborators. Edited by John H. Musser, M.D., and A. O. J. Kelly, M.D. Volume III, Illustrated The W. B. Saunders Company, Philadelphia, 1912. Price $6.00 per volume.

The present volume is the concluding one of an ambitious work designed to present modern methods of treatment from the standpoint of the patient's symptoms and lesions rather than from the standpoint of the drug. If any mistake has been made in its compilation it is that too many authors have been assigned to the task. There are fifty-five articles, written by thirty-eight contributors, with the result that some of the contributions are not more than two pages in length. On the other hand, it is only fair to state that in almost every instance the name of the author is familiar to the profession as that of one who has paid particular attention to the theme with which he deals.

The first ninety-seven pages are taken up with the constitutional diseases; and respiratory diseases, the consideration of which follows, covers 145 pages; diseases of the digestive system, on the other hand, covers 323 pages; diseases of the urinary system, 80 pages; diseases of the nervous system and muscles and diseases of the mind cover 312 pages. The articles are well written, adhere largely to treatment, and do not diverge into considerations of etiology

and pathology. The volume provides excellent information which will be of great value to every general practitioner.

TUMORS OF THE JAW. By Charles Locke Scudder, M.D. With 353 Illustrations, 6 in Colors. W. B. Saunders Company, Philadelphia and London, 1912.

Our French and German colleagues easily pass us in the production of creditable monographs and exhaustive treatises containing full expositions of subjects with which they deal. Many American workers, however, are no longer content with condensed, concise, and epitomized reviews, but are recording in larger ways, and more permanently, personal observations woven into most attractive fabrics. The volume before us is of this type, embracing nine chapters, as follows: Epulis, Sarcoma of the Jaws, Benign Tumors of the Jaws, The Odontomata, Carcinoma of the Jaws, The Diagnosis and Operative Treatment of Malignant Disease of the Upper and Lower Jaws, Tumors of the Palate, Leontiasis Ossea, and Prosthesis. The treatment of each division is along conventional lines and without noteworthy departure. Many lesions are depicted both macroscopically and microscopically, and generalizations as to symptoms are often condensed into case histories, accompanied by good illustrations. In addition to detailed histories of individual cases, summaries of results from various clinics—Heidelberg, Johns Hopkins Hospital, Massachusetts General Hospital, and elsewhere—are also incorporated. Although one seeking points adapted to disputation could easily find them, they are as a rule of a kind justly permitting two views. Sometimes statements that are strange bedfellows occur; thus, in speaking of epulis we are told (p. 18): "It appears most often in childhood and young adults. In a series of 117 cases the third and fourth decades were most frequently involved." Fibromas of the jaw (p. 141) "appear in middle life, most commonly during the third decade." Such disconformity is, however, quite exceptional.

The volume is avowedly a clinical work, nevertheless such abstract science as is necessary properly to elucidate the origin and nature of a tumor is incorporated with unusual clearness and detail. Although evident elsewhere, the chapter on odontomata may be especially cited in support of the view just expressed. Throughout the volume the author shows an intimate knowledge of many phases of practical embryology and uses his information discreetly, without undue prominence on one hand or sketchy incompleteness on the other; proportion is well maintained. In the discussion of leontiasis ossea a suggestion of relation to hemihypertrophy of the face or to osteitis deformans would have been permissible; further, it is not certain that it "corresponds to elephantiasis in the soft parts." Extended study of elephantiasis and elephantoid conditions strongly indicates the relation of both to lymphatic obstruction. There is no evidence that such factors are operative in leontiasis.

Throughout the volume diagnosis and treatment, especially treatment by operation, are fully and adequately considered. The volume abounds in illustrations—353 in 357 pages—of a practical kind, but usually without pretensions to the artistic. The publisher has creditably fulfilled his obligation as to typography, paper, and binding; the reader must wish, however, that equally satisfactory results could have been attained without so much weight; three pounds should not have been needed for less than 400 pages of text. W. M. L. C.

THE PRINCIPLES OF HUMAN NUTRITION. A Study in Practical Dietetics. By Whitman H. Jordan. The Macmillan Co., New York, 1912. Price $1.75.

The author of this book is Director of the New York Agricultural Experiment Station, and has heretofore written a volume upon the feeding of animals. He makes no claim to having written on his own authority, but has relied upon the conclusions of those authorities and investigators whose sound scholarship in this line of research is unquestioned. He therefore has quoted largely from the standard books upon physiological chemistry and upon nutrition, and has used as illustrations figures

from the book upon "Anatomy and Physiology for Nurses," published by Lea & Febiger.

The object of the volume is well described in its title. The first chapter deals with plants as a source of human sustenance, the second with the chemical elements involved in the nutrition of the body, and the third and fourth with the compounds of human nutrition. The fifth chapter deals with the digestion of food, and the sixth with the distribution and transformations of the digested food. The seventh and eighth chapters deal with the functions of food compounds and the law of nutrition. The second part of the book deals with practical dietetics, the relative values of foodstuffs and their use at various periods of life. There is also a chapter upon food economics, special dietetic methods, nutrition of children, the character and food value of certain commercial articles, and the preparation and keeping of foodstuffs. Perhaps the chapter dealing with the food value of certain commercial articles will prove most interesting to the average reader, who is in doubt as to whether he should accept the glittering promises made by the manufacturer as to the nutritious quality of his product.

It is evident that the book is in one sense a representative of one department of those subjects which are usually considered in larger volumes under the term "Hygiene." It is well written, carefully prepared, and can be read with advantage by physicians, medical students, nurses, and dieticians.

HEALTH AND MEDICAL INSPECTION OF SCHOOL-CHILDREN. By Walter S. Cornell, M.D. Illustrated. The F. A. Davis Co., Philadelphia, 1912. Price $3.00.

As Dr. Cornell is Director of Medical Inspection of Public Schools in the City of Philadelphia and Lecturer on Child Hygiene in the University of Pennsylvania, he is well qualified to prepare a book giving useful information along the lines indicated in this title. The opening part of the volume deals with medical inspection and hygiene, and then with the defects and diseases of various portions of the body, as the eye, ear, nose and throat, the teeth, the nervous system, the mind, the skin, speech, and of the skeleton. There is also a chapter of nearly forty pages upon the infectious diseases, with special reference to their prevention; one upon the prevalence of infections in disease, in which interesting tables are given derived from an examination of children in institutions and public schools. Interesting charts as to the prevalence of the various infections are also printed. To the large class of teachers who are interested in this branch of their work the book will undoubtedly prove of great value.

THE TRAGEDY OF CORIOLANUS. Edited by Stewart P. Sherman, Ph.D. The Macmillan Co., New York, 1912. Price 85 cents.

This small volume, which can easily be slipped into the side pocket of a coat, belongs to a new series called "Tudor Shakespeare," which is to appear in forty volumes, two of which are published each month. The publishers wish the book called to the attention of medical men because of the convenience with which it can be carried, its low price, and in the hope that it may prove entertaining when the tired doctor comes home from his work. Notwithstanding its moderate cost and its light weight the paper is good, as is also the type, and we have no doubt that many of the volumes of the series, if not all of them, will prove popular to those of our readers who are fond of classical literature.

THE DIAGNOSIS OF NERVOUS DISEASES. By Purves Stewart. Third Edition. E. B. Treat & Co., New York, 1911.

The third edition of this admirable textbook comes before us in a slightly enlarged form. The subject of the work, as before, is that of diagnosis, and it is approached from the clinical standpoint; abstruse details of mere theoretical matter are omitted. Statements and descriptions are clear and concise and presented in such form as to appeal both to the student and to the busy practitioner. Here and there additions have been made to the text, while a number of new illustrations have been introduced. The value of the book, already great, has

thus been still further enhanced. The illustrations, as in the previous editions, consist almost wholly of original material, a small number only from other works being introduced, and these being mainly of diagramatic value. We cannot but commend the work most favorably. F. X. D.

THE TAYLOR POCKET CASE RECORD. By J. J. Taylor, M.D. The Medical Council Co., Philadelphia, 1912. Price $1.00.

This little book, which is of the same size and shape as the ordinary "visiting list" in which physicians make a record of their visits, is designed, as its name indicates, to afford a means by which case records can be kept in small volumes. The headings which are given are excellent, but the space is so small in which records can be made that we fear it cannot prove very useful unless one uses a very fine pen, has a very smooth surface to write upon, and is not in a hurry, all of which conditions are usually absent when the busy practitioner is at work.

MATERIA MEDICA STEP BY STEP. By Arthur W. Nunn, F.C.S. P. Blakiston's Son & Co., Philadelphia, 1911. Price $1.40.

It is manifest from its title that this little volume of little over 200 pages deals solely with the elementary facts of Materia Medica as they are studied by the student of pharmacy and the first-year medical student. Each step, so-called, or chapter, is followed by a series of questions, so that the student can quiz himself on what he has just passed over.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures and Original Articles. Edited by Henry W. Cattell, A.M., M.D. The J. B. Lippincott Co., Philadelphia, 1911. Price $2.00.

We have so frequently noticed the appearance of earlier volumes of International Clinics that our readers must be familiar with their objects. In the present volume the first five articles, which cover 27 pages, are therapeutic in nature. Others follow on Diagnosis, Medicine, Surgery, and the various specialties, as well as Medical Jurisprudence, the Economics of Medicine, and the History of Medicine. The book is freely illustrated.

INDEXED CATALOGUE OF THE SURGEON-GENERAL'S LIBRARY OF THE UNITED STATES ARMY. Authors and Subjects. Second Series. Volume XVI. Skinko to Styanus. Government Printing Office, Washington, 1911.

The Indexed Catalogue of the Surgeon-General's Library of the United States Army is so well known to medical men the world over that it is unnecessary to describe it. It is only of interest to note that the second series has already advanced so far in the alphabetical list of references.

THE PRACTICAL MEDICINE SERIES. Edited by G. P. Head, M.D., and Charles L. Mix, M.D. Volume X: Nervous and Mental Diseases, by Hugh T. Patrick, M.D., and Peter Bassoe, M.D. The Year Book Publishers, Chicago, 1911. Price $1.25.

Last year, our readers will recall, we referred in terms of praise to the excellent summary of current literature on Nervous Diseases by Dr. Patrick in this well-known annual. The work this year has been done equally well, the illustrations are excellent, and the type is of such size that it can be easily read.

ONE HUNDRED SURGICAL PROBLEMS. By James G. Mumford, M.D. W. M. Leonard, Boston, 1911.

There are many surgeons of large experience, trained to accurate recording of their cases and gifted with the power of logical deduction, who could write a book of practical experience which would be interesting and instructive. There are few who have the personal gift of vividness and the literary style which characterize all of Mumford's writings. These case records are roughly classified and form a memorial of surgical interventions which, if not always successful in their outcome, were founded on sound reasoning, in some cases almost preternatural intuition, and always on the application of the best modern methods of practice.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

This month has brought us the grim realization of a universal coal strike, and at the time of writing there seems little prospect of peace. The cessation of the coal supply has brought home to us in a most vivid manner our utter dependence upon it as a source of fuel, as one industry after another is becoming paralyzed and thousands of workers are exposed to starvation in consequence. In London the hardships of the strike have not as yet been greatly felt, beyond the inconvenience of a restricted train service, but in the manufacturing towns of the north the distress has already become acute. It is possible that this great strike may mark the beginning of the end of the practical monopoly of coal as a source of fuel. Renewed efforts will be made to find an efficient substitute, and it is a significant fact that the largest oil-driven vessel in the world paid a visit to the Thames during the first few days of the strike. If oil-driven engines are found to be efficient for battle-ships and large liners, an enormous saving in coal will be effected, and the whole commerce of the nation should not again be held up by a single industry. The hospitals are among the sufferers, especially those which have not large storage places, and one hospital at least has had to buy coal at double the usual price, while at another hospital it has been decided not to admit any more new patients until the strike is over. The weather unfortunately remains cold and damp, which greatly aggravates the sufferings of the poor.

After a silence of four years the Royal Commission on Vivisection has at length issued its report. The delay is partly due to the death of two of the commissioners and the illness of others, but the remaining commissioners are unanimously agreed in their findings. Unfortunately the report is rather behind the times, as it only deals with the evidence given before it, and that evidence was given in the years 1906 to 1908. In consequence no mention is made of Flexner's work on spotted fever and infantile paralysis, nor of the results obtained by preventive measures against typhoid fever in the Indian army and also in the United States army. The report deals with certain charges made by antivivisection witnesses against the administration of the Vivisection Act, and against men licensed under the act. The commissioners dismiss the charges as groundless except in one case where they rebuke a licensee. The report recalls at great length the advantages gained by the help of experiments on animals during the past thirty years, and points out that this increased knowledge has also been of benefit to the animal world, as animal diseases are now so much better understood. With regard to inoculations and such-like experiments, which are 95 per cent of all experiments on animals in this country, the commissioners are agreed that, in the large majority of these cases, the animals do not appear to suffer pain. Turning to the moral side of the question the commissioners come to the conclusion that "experiments on animals, adequately safeguarded by law, faithfully administered, are morally justifiable, and should not be prohibited by legislation."

The appeal issued by the University of London for money to build a new headquarters for itself has already been successful in obtaining promises of nearly a quarter of a million in the course of one week. An anonymous donor has promised to give £100,000 toward the acquisition of a site, and the Drapers' Company has offered to erect a new Senate House and administrative offices at a cost of £60,000. The proposed site is just north of the British Museum, and is thus in the very center of the metropolis. The new buildings, when completed, will form a convenient rallying ground for the graduates of the university, who will be able for the first time to feel that they belong to a corporate and visible alma mater.

One of the immediate results of the in-

troduction of the National Insurance Act has been absolute stagnation in the sale of medical practices. A doctor in the Bankruptcy Court attributed his failure to the fact that he had been unable to get any offer for his practice owing, he said, to the "slump" caused by the act. Medical agents declare that the sale of practices has been paralyzed in places where a large proportion of the population will come within the scope of the Insurance Act, but with high-class practices in the West End and the residential districts of large provincial cities the demand has increased, as such practices are least likely to be disturbed by the act. Meantime the negotiations between practitioners and the Insurance Commissioners have not eventuated in any agreement, and the government spokesmen are beginning to threaten that, unless an agreement is reached, the act will be worked without the medical benefits. As, however, "free doctoring" has been one of the most prominent features of the bill, it seems unlikely that such a drastic step will be taken.

An interesting test in regard to an alleged malingerer was carried out by a medical referee in a county court compensation case recently. A laborer while in the employ of a company had his leg injured and was granted compensation. The company alleged that the man had completely recovered the use of his leg but was shamming incapacity, and was stiffening his limb on examination so that it could not be bent. The medical referee attached to the court proceeded to put the defendant under an anesthetic, and while the man was unconscious, examined his knee. He found that it then moved easily and freely, and the judge therefore terminated the compensation award.

The militant suffragettes had a great demonstration this past month. Armed with hammers, stones, and similar implements they proceeded in small parties to the Strand, Bond Street, and other well-known centers, and commenced a window-smashing parade. It was a sad sight to see large glass windows with holes in them and large star-shaped fractures. Nearly two hundred were run in by the police and received sentences of hard labor for this wilful damage. Others were not saved by the police before they had come in for rough handling, and one woman at least was pushed into a cab and most of her clothes were thrown in after her. So acute was the apprehension on the part of the owners of windows that no woman with a muff could look into a window without finding several assistants hovering about, and intimating that she had better step inside or move on. A few days after the prime instigators of this movement were arrested for conspiracy, and will in due time have to take their trial. Miss Pankhurst has so far evaded arrest, and it is believed that she is safely out of the country.

The interhospital Rugby football cup was won again by Guy's Hospital, after a good game in the final against London. The usual demonstration took place on the ground before and after the match.

PARIS LETTER.

BY M. A. C. TUCKER, M.D.

The Paris medical body has heard with unanimous satisfaction that the court of appeal of the Seine has just invalidated the judgment of the civil tribunal below ordering Dr. Bazy to pay five thousand francs damages for—so it was alleged by plaintiff—"having forgotten two compresses in the abdomen of a woman patient, he having operated two years before for an ovarian cyst." The surgical operation had taken place in one of the leading hospitals of this city, and naturally *gratis pro Deo*.

In giving their written decision, the higher judges pointed out that the complainant owes her life to the eminent surgeon, and moreover that it has been in no way established that he had been guilty of the professional fault brought against him. M. Millerand, the celebrated advocate and actually French Secretary of State for War, pleaded for defendant, assisted by a medical barrister. All professional gentlemen consulted on the matter were of one opinion, viz., that the story is, to say the least, absurd. Dr. Bazy being one of the most esteemed and respected professors of the

capital, the sensation was great at the outset of the trial when he was sued and first tried, and when the tribunal had awarded the plaintiff the said five thousand francs instead of the fifty thousand demanded.

Over every one of the public buildings are written in conspicuous characters "Liberté, Égalité, Fraternité," according to which one would feel inclined to think that the territories of the French Republic constitute a paradise of freedom and of brotherly feeling for mankind. Unfortunately "liberté" in many cases is only but a name. In this free and democratic country it is forbidden to employ nurses in religious garbs. It had universally been the cherished custom to have recourse to the services of Sisters of Mercy or of other religious orders both for hospitals and private nursing, but this is now a thing of the past, as can be judged by this passage of a letter lately sent to a dispensing doctor of Périgueux, the chief town in the southerly department of the Dordogne: "Sir: You have taken no notice of our intimation and informations as to the formalities to be fulfilled in order to obtain permission to employ religious nurses in your clinic, and four Sisters of Saint Martha are employed by you. I have lately been asked by the prime minister to send him a list of establishments of your kind existing in my department with a view to enjoin them to have the congregationists dismissed without delay, and I must warn you, in case of the administrative injunction not being complied with, the matter will be placed in the hands of the public prosecutor." The document is signed and sealed by the Prefect or Governor of the Dordogne. Naturally enough, the whole of the medical corps in France loudly protest against this tyrannical and ridiculous measure.

The Medical Syndicate of the Seine has recently forwarded a memorandum to all the members to the effect that in order to assist the police in their efforts to abate the quack doctor nuisance it would be advisable for all genuine practitioners to send to the police prefect their cards and addresses, and also send notice of removal in every case of change of residence.

In one of the French colonies, New Caledonia to-wit, the authorities have decided to award in guise of bounty a sum of ten francs to all mothers for their own use for each declaration of birth. The object of such a measure is to put an end to the great tendency of the female natives to either abandon their offspring or cultivate their too frequent abortive practices.

It has been calculated that the infantile mortality under twelve months of age is an average of 143 per annum for France out of every 1000, whilst in the United Kingdom the proportion is 121 for the same number.

It has only recently been decided to establish open-air schools as the best means of preventing or curing infantile tuberculosis. Such schools will naturally be developed without the French towns, with the option for parents and guardians to choose between partial or full board. It is a curious fact that such an enlightened nation as the French should be behind all other countries in so vital and important a matter.

Up to the present the wintry weather has been particularly mild over here, and were it not for a most serious outbreak in numerous districts of scarlet fever and measles, the general public health could be considered as most satisfactory.

The Official Journal has just published the birth and death bulletin for the past year. The births show a difference of 70,583 over the deaths. That would be an optimistic outlook but for the fact that it is not due to the increase of births, but to the decrease of mortality, which has been the lowest ever recorded, exactly 703,777, which means 179 deaths for every 10,000 inhabitants.

POSTURE IN LABOR.

To the Editor of the THERAPEUTIC GAZETTE.

SIR: In your valuable publication for February there was an article on "Posture of the Lying-in Patient." I beg a little space to consider posture in labor; and although some of the statements which I will make are against all of the obstetrical canons of the past one hundred and fifty

years, yet such canons are not infallible. Why should the German woman give birth on her right side (if she does), the English woman give birth on her left side, while the woman in the United States must lie on her back? These attitudes must be the result of fashion rather than of science. It became a fashion that the woman give birth in bed, but when we cast fashion or custom aside, and consider the phenomena of labor, the bed is seen to be illy adapted for such a purpose. And yet so well established is this custom that it is quite useless to argue a more rational, speedier, and an equally safe method.

We would fear ruptured perineums and postpartum hemorrhage if we delivered our patients in any other attitude than one of the three above mentioned, and yet we have never had experience outside of these methods, neither perhaps have our authors and teachers.

It would be well if several obstetrical clinics would study the position of kneeling and squatting to see the effects in labor. My experience has been limited to the kneeling posture, and I never saw easier labors.

This is not an academic question. We are having more and more trouble in labor cases. The head of the fetus is larger than of old, while the pelvis of civilized woman tends to become of lessened diameter. To compensate we have the forceps and anesthesia, but in the process of birth we should strive to return to nature.

The natural attitude of a woman in labor is on her feet, and the present method is as contrary to all natural law as to defecate with the feet off of the floor.

A woman in labor may truthfully be compared to a constipated person who endeavors to expel feces, and without violation of true etymology a constipated person in such act is in a state of parturition, however unusual the definition. The phenomena of the expelling forces bearing on the child and bearing on a fecal mass are almost identical. But the effect of blood on man has caused him to think that there is no analogy between the two processes, yet one is as natural a process as is the other, excepting contingencies of danger. It is the contingencies of danger, or the fear of accidents, which must be put aside if we are to give the woman in labor the benefit of the normal positional mechanism of labor.

We are not conversant with the method of delivery in Indo-China, for instance, but if quoted it would be met with the rejoinder that we are wiser than they, and yet we may not be if we do not follow natural processes in labor—at least not wiser in this particular.

We do our best to imitate nature by causing the woman to assume the lithotomy position in the last throes of labor, which position she would instinctively assume, but we deprive her of the effect of gravity. The kneeling or the squatting, the North American Indian attitude, is the position *par excellence* in order to accomplish delivery with facility.

It is evident that nature never designed that the primipara should suffer for seventeen hours, and the multipara twelve hours. None of the lower animals, except in unusual cases, suffer so long. They assume natural attitudes, and if restrained by the fears of their owners, and made to assume artificial postures, have their labors much prolonged, without compensatory benefits.

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ARGYROL IN BURNS.

To the Editor of the THERAPEUTIC GAZETTE.

SIR: I have been using a 25-per-cent solution of argyrol in water to paint all burns of slight degree, and 25 per cent of argyrol in petrolatum, with a few drops of water added to cut the grains, for burns of greater extent and severity. These applications will stop the pain instantaneously and will control the inflammation in a short time if the skin is not destroyed, and will save a great deal of skin which is on the border-line of loss. This dressing should only be used for a few days, then the usual dressings applied. I do not know whether argyrol has ever been used for this purpose before. Sincerely yours,

PAONIA, COLORADO. N. B. NEWCOMER.